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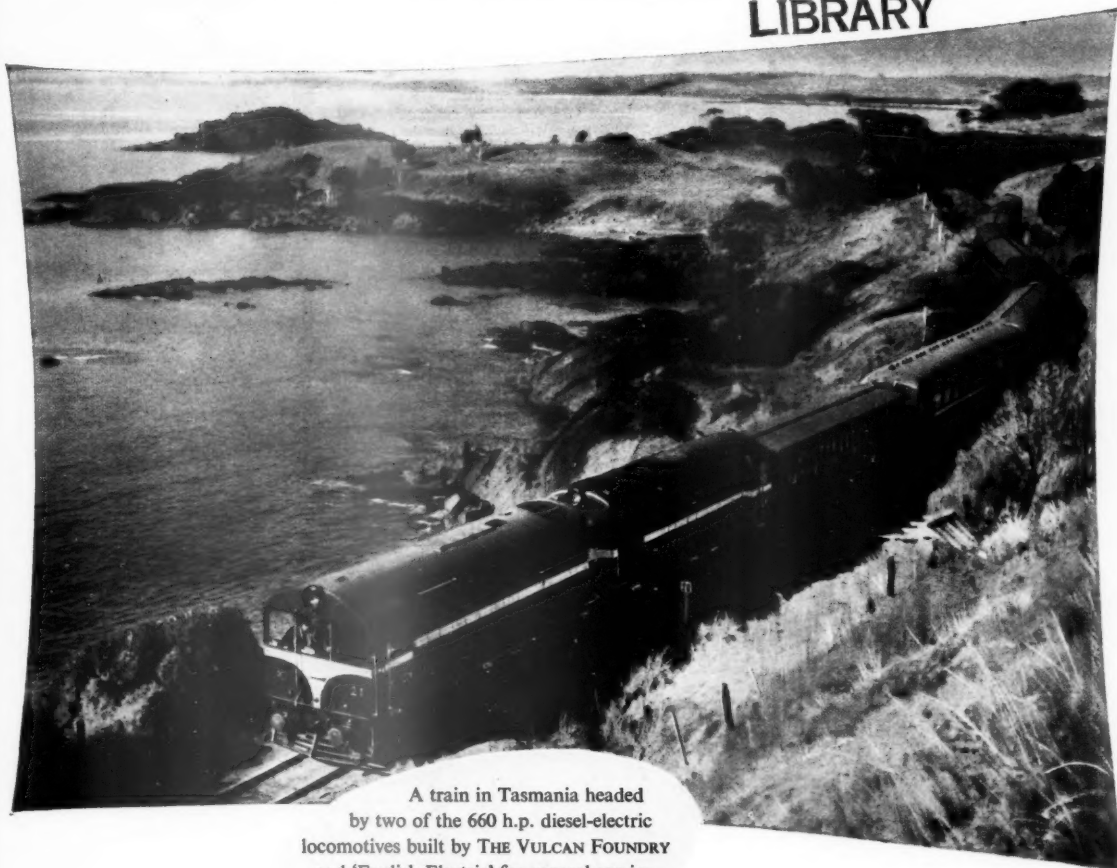
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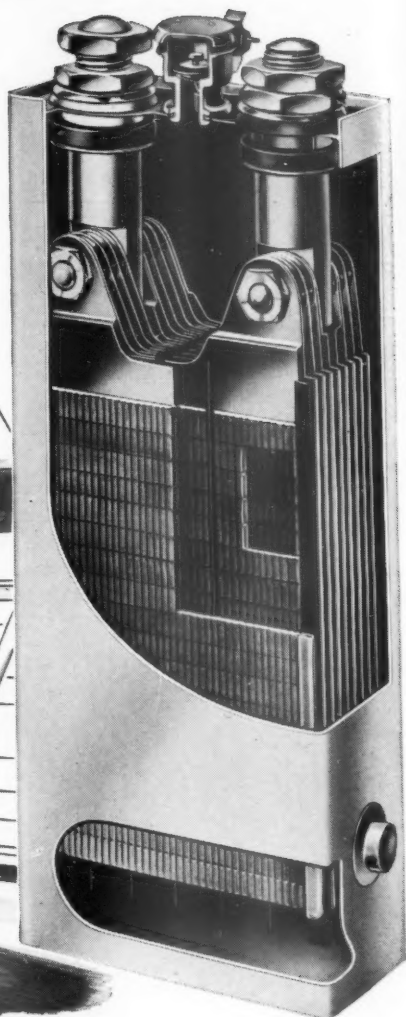


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### Reduced Railway Investment

A THREAT to British Railways modernisation programme was implied in speeches made by Mr. Peter Thorneycroft, Chancellor of the Exchequer, last July, though it was afterwards somewhat watered down by other members of the Government. Now it has become real with the sudden raising of Bank rate last week to 7 per cent, the highest rate since 1921. Though forced on the Government mainly by external pressure on the pound sterling, the measure is intended to be anti-inflationary, and will have far-reaching consequences throughout British industry. Public capital expenditure, including that of the British Transport Commission, is to be frozen at the 1957 level. The investment expenditure by British Railways was expected to amount to some £120 million in 1957, rising to £135 million in 1958 and £140 million in 1959; thus in the next two years investment will be reduced by £35 million. When allowance is made for the effect of inflation on prices, the actual physical reductions in the modernisation plan are likely to be even greater than these figures suggest. There is some hope that the Chancellor, in announcing the standstill on investment levels, may have been thinking of the general level

of public investment rather than of individual industries. If so, the Government should consider very seriously the consequences of reducing expenditure on modernisation of the railways. "Modernisation" is not strong enough a term. What has been planned is simply those essential measures which will enable British Railways to give efficient service to the industry and the nation at large. Nevertheless, Mr. Harold Watkinson, Minister of Transport & Civil Aviation, has asked the Commission to make cuts in investment, and the Commission is now considering how best to do this. Curtailment of the investment programme must reduce railway earning-power, so that the current demands for higher wages and shorter working hours on British Railways are more than ever likely to be resisted strongly by the Commission, no doubt with full Government support. Conversely, the effect of a 7 per cent Bank rate on the cost of living, and particularly the effect through dearer mortgages on the many railwaymen buying their own houses, is likely to make the trade unions all the more insistent in their demands. British Railways, because of their unfortunate position at the beginning of the annual wage cycle, will face difficult conditions in the weeks ahead.

### British Electrical Conference in Brussels

A CONFERENCE will be held in Brussels on May 16 and 17, 1958, of representatives of the industrial associations and firms supporting the collective exhibit of the British electric and allied industries at the 1958 Brussels World Exhibition. Invitations to be represented also have been sent to some scientific and professional bodies. The President of the conference will be Sir Vincent de Ferranti and the Chairman of the Organising Committee Mr. D. Maxwell Buist, Export Director of the British Electrical & Allied Manufacturers' Association. As is apparent from the details given elsewhere in this issue, the several branches of British industry concerned will be powerfully represented. The object is to focus world attention on British achievements in this field. The duration of the World Exhibition is April 17 to October 19, and the conference is well timed in the earlier weeks, when interest will be at its height. The part played by British industry in the development of electric railway traction will be prominently featured.

### The Superheater Co. Ltd.

SINCE the Superheater Company's works at Trafford Park, Manchester, were established in 1914, the growth of business has necessitated progressive expansion, and during the present year further works extensions have been completed. These include enlarged administrative and drawing offices to provide for greater output, for manufacture of equipment of increased size for the largest power stations and for the fabrication of heat exchangers, including components required for nuclear power plants. The works now extend over an area of 14 acres, and on Wednesday last an Open Day was held. The guests, who included representatives of railways in Britain and overseas, the locomotive and allied industries, engineering consultants, inspecting authorities and the Central Electricity Authority, were shown over the premises. The Superheater Co. Ltd., through its founders, has maintained an unbroken link with the evolution of the superheater, which was first applied by Wilhelm Schmidt to a locomotive of the Prussian State Railways in 1887. Since then there has been a considerable widening of the company's activities, and as a result of its specialised experience in superheated steam engineering, it now has an organisation with exceptional facilities for the manufacture and design of heat exchange apparatus of many kinds including that used in the generation of electricity from nuclear energy.

### Further Electrification in India

THE two sections of main line in the West and South which the Indian Railway Board has decided to electrify at 25 kV., 50 cycles, differ materially. One is



the 190-mile broad-gauge double-track main line of the Central (former Great Indian Peninsula) Railway between Igatpuri and Bhusaval; Igatpuri is the summit of the ascent of the Ghats, and the terminus of the existing 1,500-V. electrification, some 85 miles from Bombay. Bhusaval is the junction of routes to the North and to the East via Allahabad, and eastwards via Nagpur. The whole 190 miles is one of the most heavily trafficked main lines in India. Ample water power is available from the Ghats. The second section to be electrified is the 83 miles of the Southern (former South Indian) Railway metre-gauge main line between Tambaram and Villupuram. Tambaram, 18 miles from Madras, is the terminus of the 1,500-V. electric suburban trains; Villupuram is an important junction of metre-gauge routes. The section is single line, but carries a heavy freight and passenger traffic. Our information is that it is not intended to double the line, but to increase capacity through the higher speeds made possible by electrification and presumably through re-signalling. There is now no great technical difficulty in arranging junctions between the different systems.

### Overseas Railway Traffic

**P**ARAGUAY Central Railway receipts for the week ended September 6, 1957, were G1,909,251 compared with G2,268,663 for the corresponding week of 1956, a decrease of G359,412. Receipts have in general been lower since July 1 than in the corresponding period of 1956, and at September 6 the aggregate receipts were G19,793,573, compared with G20,277,992 for the same period of 1956. Costa Rica Railway receipts for July were colones 1,821,649 compared with colones 1,759,433 for July, 1956, an increase of colones 62,216. The latest figures received from the Midland Railway Company of Western Australia Limited show that estimated road and rail receipts for June were £A52,705, against £A64,375 for June, 1956, a decrease of £A11,670. The aggregate receipts for the year ended June 30, 1957, were £A899,467 compared with £A835,848 for the previous year, an increase of £A63,619. South African Railways & Harbours railway receipts for the week ended July 27, 1957, were £2,828,636 compared with £2,597,202 in the corresponding week of 1956. As in previous weeks, receipts in general continued to rise above the 1956 figures, and at August 27, 1957, aggregate receipts from April 1, were £57,452,557 compared with £55,296,091 in the corresponding period last year.

### German Railway Officers' Visit to Britain

**F**ORTY-FIVE senior officers of the German Federal Railway, members of the Vereinigung der Regierungsbaumeister des Maschinenwesens (Motor) (V.R.M.), arrive in London next Sunday on a week's visit to Britain. Conducted by Mr. E. R. Brown, Works Manager (Locomotives), Horwich, the party will follow an itinerary designed to show what British Railways are doing to implement the modernisation plan. The V.R.M. can be compared with the Institution of Mechanical Engineers in this country. It incorporates more than 500 mechanical and electrical engineers, university graduates, mostly in the service of the Federal Railway. The visitors will include the President of the V.R.M., Herr Harres, Chief Motive Power Officer of the Cologne Division of the Federal Railway, and the Vice-President, Professor Dr. Alfred Kniffler, Electrical Engineer of the Hamburg Division. They will find many things to interest them. Among these are the rationalisation of freight traffic by mechanical handling, use of special wagons, and new marshalling yards; new motive power and rolling stock; electrification on various systems; improvements in signalling; and train working at peak traffic periods. In all of these, British Railways and London Transport can show something in which they excel. The exchanges of views with British railwaymen must result in considerable benefit to all concerned.

### Sydney-Melbourne by Standard Gauge

**T**HE announcement last Monday by Sir Arthur Warner, Minister of Transport for Victoria, that the Australian Commonwealth Government has agreed to provide 70 per cent of the £A10,000,000 needed for the standardisation of railway gauges between Sydney and Melbourne opens the way for this long-awaited project. The Commonwealth Government is also willing to lend the remainder of the money required to the governments of New South Wales and Victoria for 53 years. It is reported that work will commence in six weeks and be completed in some four years. The through line for the 590-mile route will be on the standard (4-ft. 8½-in.) gauge, which already exists in New South Wales from Sydney to the border town of Albury. From Albury to Mangalore in Victoria a new standard-gauge line will be built alongside the present 5-ft. 3-in. gauge line, and for the final 70 miles from Mangalore to Melbourne it is reported that 5-ft. 3-in. tracks will be reduced to 4 ft. 8½ in. The Melbourne-Sydney link was regarded by the Wentworth committee, which issued its report on gauge standardisation for the Commonwealth Government last October, as one of the most important to be undertaken in Australia.

### Work Study in the Western Region

**S**INCE the successful inauguration of the Regional Work Study School in January, 1956, there has been a steady development of the use of work study techniques in many fields throughout the Western Region. In 20 months the school has trained 36 Senior Work Study Assistants, with 136 General Work Study Assistants to work under them; and some 354 officers and other members of the staff have attended appreciation courses ranging from one week to one or two days' duration. The school now has its own team of lecturers drawn from the senior courses, who have successfully completed their training. There can be no doubt that the decision to establish the Work Study School will prove to have been a very important factor in the implementation of the railway modernisation programme. Hitherto the emphasis in the school's activities has been on the application of work study to practical operations; but it has now been decided to introduce specialist courses devoted to the study of office work in its various forms. The first of these, and the first of their kind on British Railways, attended by office staff drawn from the principal departments of the Region, started on September 2.

### Office Methods Courses

**E**ACH Western Region course in office methods study has been designed to extend over a period of eight weeks. Trainees receive instruction in the investigation of the many aspects of office work. Lectures are interspersed with practical exercises and demonstrations. Use is being made of filmed material for training, and a feature of the course is the placing of trainees on practical jobs for three weeks whilst they are still under instruction. In this way students get first-hand experience of the problems likely to arise in the practical application of office methods work. The new courses have as an objective the production of trained office method investigators who can apply the principles of scientific investigations and analysis to office work wherever it is found, with a view to its simplification and improvement. As with the establishment of the Regional Work Study School, the services of a leading firm of industrial consultants have been retained in connection with the introduction of the specialist office methods courses.

### Increased Freight Rates in U.S.A.

**I**NCREASED rates for the carriage of freight by rail in the U.S.A. have been authorised from August 26 by the Interstate Commerce Commission. In the early part of the year many of the railways applied for a 22 per cent increase, which would have brought in a further \$1,600 million annually; they were granted an interim increase of



7 per cent, which brought in additional revenue at the annual rate of \$455 million, and the increase resulting from this award should produce another \$443 million, though the total will still fall some \$702 million short of the railway demand. The actual railway applications varied according to region. Those in the Eastern and Western territories applied for a general 22 per cent increase, but those in the Southern territory limited their application to 15 per cent, and some, like the Southern Railway, do not propose to charge the new rates in cases where the addition in their judgment might lead to loss of traffic. The total increase in Eastern territory rates will be from the interim 7 to 14 per cent, in Western territory from 5 to 12 per cent, and in Southern territory from 4 to 9 per cent. There are "hold-downs," or restricted increases, in the rates on various commodities such as coal, grain, livestock, meats, sugar, fruit, vegetables, lumber, phosphate rock, and potash. It is the contention of the Interstate Commerce Commission that the railways should look primarily to technological advances in equipment and operation as their major hope for increasing their freight revenues, although the door has not been finally closed on any application for a further increase in rates.

### Main-Line Electrification Procedure

THE progress of work in any major electrification scheme depends largely on the degree of co-operation between the contractor and railway departments concerned, and the working procedure adopted by the contractor. Investigation and survey of the track, and design and installation of the overhead and other stationary equipment are usually carried out by a sole contractor. The normal working procedure is outlined on another page this week, and is typical of any major scheme. The accompanying illustrations refer to the work being carried out by British Insulated Callender's Construction Co. Ltd., under the direction of their District Engineer, Mr. W. A. Kinsman, on the Crewe-Manchester section of the London Midland Region. This is the first stage of the electrification of the Euston-Manchester/Liverpool lines on the 25 kV. a.c. system adopted as standard for main-line electrification under the British Railways modernisation plan.

### Mechanisation in the Signal Department

THE equipment exhibited to the members of the Institution of Railway Signal Engineers at their autumn technical meeting at West Ealing on September 14, reported in this issue, showed very clearly how inventive genius and manufacturing skill can combine to provide increasing means of meeting those changing economic and other conditions which face the signal engineer today, not only in carrying out new works but in effecting adequately that ordinary maintenance without which no signalling apparatus can function reliably. The President of the Institution, Mr. A. W. Woodbridge, Signal Engineer of the Western Region of British Railways, has given much attention to time and labour-saving methods and has applied them in numerous directions with gratifying success, as he pointed out during the meeting. The subject is now indeed being studied specially, with reference to every aspect of railway engineering and operation, by officers of all the Regions, as part of the modernisation plan, and this wise policy eventually should be reflected in appreciably reduced costs and more rapid carrying out of work of every kind.

### Earlier Accidents in Jamaica

THE serious accident of September 2 on the Jamaica Government Railway, with its exceptionally high fatality list, referred to in our issue for September 6, recalls the fact that mishaps of any consequence have occurred but rarely on that line. Until the derailment of July 30, 1938, attended with 32 fatalities, no passenger had lost his

life in a train accident since the opening of the first section of railway in the colony 94 years before, a remarkable record. A special commission was appointed to inquire into the case and found that certain rules were not being observed and that unauthorised hand signals were being used. The speed was thought to have been about double that permitted at the location, while probably some minor permanent way defects had contributed to the calamity. The train, which was carrying about 300 people, had a banking engine in rear and the use of such was immediately prohibited. An illustrated account of this accident appeared in our issue of July 21, 1939. On February 4, 1944, a goods train got out of control on a down gradient and left the rails with serious consequences.

### Power to Weight Ratio in Diesel Trains

THE introduction by the London Midland Region of 600-h.p. three-car diesel trains between Crewe, Stoke and Derby last week, referred to in our September 20 issue, emphasises the superiority in its field of this form of stock. With journey times cut by some 27 min. compared with the previous schedules, it is obvious that to provide such an interval service, with a time of 87 min. for the 51 miles and stopping at all 23 stations between Crewe and Derby, would have been uneconomic with existing steam motive power. There is now apparent in this country a trend toward raising the power to weight ratio of diesel multiple-unit stock. With diesel-mechanical trains this has been achieved in some cases by fitting diesel engines of increased power. An instance is the two-car train which recently entered service in the Eastern Region; this incorporates two of the new B.U.T. 230-b.h.p. horizontal engines developed from the smaller 150-b.h.p. units. In the Birmingham Carriage & Wagon-Drewry sets on the Crewe-Derby run, however, this has been effected by breaking away from what seems a common basic arrangement of one motor coach powered by two engines, coupled to one trailer car, in favour of a formation of three cars—one trailer car between two motor coaches sharing four power units.

### Future of Urban Transport

A WARNING that a crisis is threatening the whole future of city underground railway and bus systems because of the growth of private motor vehicle travel was given by Sir John Elliot, Chairman of London Transport, in an address to the 75th Annual Convention of the American Transit Association in Montreal last Monday. The Association represents transport operators in the main cities of America, and it is perhaps an indication of the standing of London Transport and of Sir John Elliot himself in American eyes that this was the first time in 75 years that the Association has asked an Englishman to address it.

In tracing, in general terms, the history of London Transport, he mentioned the part played by two Americans, Charles Tyson Yerkes, who brought to completion the building of the first London deep-level Underground railways, and George Francis Train, who pioneered the London tram in 1861. Unification of the means of public passenger transport in the Greater London area would not have been achieved so soon, Sir John Elliot believes, and in the form it did—if ever—had it not been for Albert Stanley, who was born in England in 1874, received his education and early training in the U.S.A., and returned to England to build up the London transport system and to become Lord Ashfield. With his name is coupled that of Frank Pick, his able lieutenant. To those two, as Sir John Elliot emphasises, London owes a great debt.

Comparing the activities of London Transport in 1955 with the statistics for the transit undertakings of the U.S.A. for that year, he stated that the nearly 10,000 road vehicles operated by London Transport are equiva-

lent to some 15 per cent of the total owned by all the North American transport undertakings. They work 19 per cent of the vehicle miles and carry 35 per cent of the number of passengers. The Underground railways, with just over 4,000 cars, have 44 per cent of the number owned by all North American undertakings: they work 55 per cent of the mileage but carry only 36 per cent of the number of passengers. Explaining the reasons why London Transport carries a much higher proportion of the passengers on the roads with a much smaller proportion of vehicles and vehicle-miles, with the converse on the railways, he points out that London Transport railways carry more long-distance and the road vehicles more short-distance traffic than in America. This is accounted for largely by the fares structure. In London, more than 75 per cent of the traffic on the Central Area buses is carried at fares up to 4d. for two miles. Most of that traffic would be lost if a flat fare were to be adopted, as in America, where a representative fare—because it must cover the cost of the average journey—would be about 1s. 1d.

The direct competitor with public transport is the private vehicle, particularly the private motorcar. In Britain there is one motorcar to every 13 or so of the population, against one to every three of the population in North America. The relative inadequacy of the roads, however, brings the British figures to 28 motorcars per mile of road compared with 22 in America.

During the last few years, when street congestion has been growing rapidly, much passenger traffic has been transferring from the road services to the Underground. This experience bears out the conviction of London Transport officers that, for the modern city, as much traffic as possible must be taken underground. It seems that underground railways will be able to hold their own against road competition in the years to come, and this is confirmed by experience in America and Europe—including Russia.

Among the five largest population centres in the U.S.A. without rapid transit (urban electric railway) facilities, losses of passenger traffic from public services (buses and trams) to the private motorcar in 1951-56 have been as high as 50 per cent. In the five largest cities with rapid transit the limit of losses has been around 25 per cent. London Transport has lost 14 per cent. It is no longer easy for the road services to support the underground railways, because they themselves are competing with the private motorcar, and there is no precedent in Britain, as there is in the U.S.A. and Europe, for the Government—or the city—to provide the right of way for an underground railway free of charge or at nominal cost to the transport operator.

On peak traffic, Sir John Elliot remarks that few transport concerns can hope to make a profit out of such traffic. It demands large staffs and huge capital expenditure on equipment of all kinds which is used for a comparatively short time twice in each working day. London Transport uses two-thirds of its railway cars and a third of its Central buses in the peak hours only. Profits must come from the off-peak traffics, and it is there that the private vehicle and television have made the greatest inroads.

If it is shown, in the end, that the public does not require and will not support an off-peak service, then there are only three solutions: a peak-hour service at very high rates (which public opinion would not tolerate); a much-reduced peak-hour service to cut the cost of providing it; or a subsidy from city, state, or nation. London Transport believes that the public requires an off-peak service, and that if it provides more comfortable and attractive trains and buses, with efficient and courteous staff to handle them, it can find enough off-peak traffic to keep going. Street congestion in large cities, Sir John Elliot concluded, "will not kill public transit, if those in charge of it are lively and skilful and determined. It will seriously restrict the use of private cars during business hours. In other words, we shall have to go on working for a living. And why not?"

## A Challenge to Locomotive Engineers

THE importance of operational research on new types of locomotives and rolling stock, so as to facilitate improvements in technique and operation necessary for the modernisation of railways, and the invaluable service the Institution of Locomotive Engineers can provide in this respect, were stressed by Mr. E. S. Cox, Mechanical Engineer (Development), British Railways Central Staff, British Transport Commission, in his Presidential address to the Institution last Wednesday. He contrasted the present attitude of the railway engineer to this subject with that prevalent 50 years ago. Almost axiomatic today, the need of accurate details and observation was then often difficult to meet—sometimes as a legacy of "the insular secrecy with which the old-time railways often liked to cloak their actions, just occasionally perhaps as a by-product of the instinctive engineer who preferred to rely more upon his own genius than upon recordable facts," and where these features were absent, often by a collective lack of continuity which has required so many good ideas to be re-invented or resurveyed time and time again before they have finally gained acceptance.

To some such considerations, Mr. Cox ascribes the fact that the benefits of electrification, first demonstrated so long ago, have remained until now, and with honourable exceptions, unrealised. The empirical approach to design has left locomotive engineers of today with many problems of good riding still to be solved. Lack of the ability to measure operating factors held back application of the diesel multiple-unit train, and even steam has only on its death-bed solved its fundamental problems of draughting and combustion, by scientific means of observation and measurement long denied. Railway engineers have acquired a progressive availability of knowledge and information, perhaps as a result of the grouping of the British main-line railways in 1923 and nationalisation in 1948 but, he emphasises, if the tremendous upsurge of the will to modernise is not to die away technically, more widespread and more accurate measurement of development, research, and testing is essential. This must be backed up by means of assessment and recording of operating and maintenance experience at home and abroad to a greater extent than has ever been done before. This presents a great opportunity to the Institution, of which the membership includes so large a proportion of those who will have to collate this mass of knowledge.

Mr. Cox develops his theme, "approach to modernisation," the title of his address, by recounting some personal impressions of railway developments in this country over the past 50 years, with which he has been interested or concerned, including the earliest interurban line to be electrified in this country, the Liverpool-Southport section of what is now the London Midland Region. This service attained a high degree of operating reliability considering the endless problems which must have faced the pioneers of electrification, and, which, he observes, coupled with the hourly non-stop service of the former Lancashire & Yorkshire Railway between Liverpool and Manchester, constituted some 50 years ago "a pocket of modernisation" containing the elements of high speed, even-spaced interval frequency, and punctuality, which are the ideals to which railways in this country are striving. The electrification scheme drawn up in 1922 of the former L.N.W.R. from Crewe to Carlisle, some of the projected steam and steam-turbine-electric locomotive designs of the L.M.S.R. and the development of diesel traction are touched on in this survey. The familiar phrases used to denigrate the steam locomotive by the diesel protagonist such as "5 per cent thermal efficiency" and "1 ton of oil versus 9 tons of coal," Mr. Cox suggests firmly, are almost meaningless and should be discarded once and for all. In paying tribute to steam power, he points out that in its final stage of development, the locomotive can have boiler and cylinder efficiencies of some 75 and 85 per cent respectively.

Four problems which arise with any scheme of modernising a railway system, and for which probably, no

ultimate solution can ever be found, are mentioned in the address. These are the selection of motive power types, the best relation of power to weight, the inter-relation of vehicle and track, and the "endless contest of standardisation with diversification." Commenting that in the main-line diesel field, two major choices lie between electric and hydraulic transmissions, and between medium-speed and high-speed diesel engines, he states that despite all that has been written, the relative merits of electric and hydraulic transmissions have yet to be established. On power to weight problems, Mr. Cox refers to current research as to how light a diesel locomotive can be for a given power and tractive effort, which in turn reverts to the characteristics of different traction systems, and to the nature of adhesion which still holds "mysteries of the deepest kind."

At the very centre of today's phase of modernisation, as he puts it, he discusses the twin problems of interaction between vehicle and track, and passenger riding comfort. He admits that a case could be argued that the riding quality of bogie rolling stock in this country has not improved decisively over the past several decades although he would not subscribe to it; this subject has been discussed at some length over the past few months in this journal, particularly in regard to some recently constructed rolling stock. It will fall to British Railways, he declares, to investigate the problems of mitigating wear of bogie components of the proportion of unsprung weight of motor bogies, and the relation between vertical axle load and wheel diameter, on which, he asserts, there are many forceful opinions but not many real facts.

The interest which industry now has, as the only source of supply of power equipments to British Railways, is emphasised in his discussion of the very difficult decisions which face railway officers on the complex subject of the rationalisation of components for locomotives, rolling stock, and freight vehicles as modernisation continues. As he points out, it is not in the field of pure engineering that this difficulty is usually encountered, but rather where more human considerations predominate, and personal taste, Regional loyalties, or individual interpretation of the public's reactions, lead to preference which can conflict with the most effective technical solution. This is a formidable, but not insurmountable, challenge to British railway engineers.

### Transport Plans for East Africa

**A** FURTHER development programme of a restricted nature, and limited to immediate essentials, has been considered necessary for East African Railways & Harbours, for the period 1958-60, by the East African Transport Advisory Council. At a recent meeting the Council recommended that a Loan Bill for £8½ million should be submitted to the December, 1957, meeting of the Central Legislative Assembly. Approximately £5½ million of the £8½ million would be needed for railway works and some £2½ million for harbours.

The principal railway projects include expenditure of £1.65 million for locomotives and rolling stock, mainly for locomotives needed for the first stage of converting the Nairobi-Nakuru section, in Kenya, from steam to an alternative form of motive power to increase capacity and overcome water supply difficulties. About £1¼ million would be required for relaying in heavier rail and for ballasting on the Tanganyika Central and Tanga Lines, for relaying between Jinja and Kampala, in Uganda, and for improvements to signalling and water supplies. Just over £1¼ million would be needed for development of marshalling yards and terminal facilities to increase their capacity, including £750,000 for the further development of Changamwe marshalling yard to serve Mombasa, and a similar amount for development of workshops and inland water services and for additional staff housing.

The chief harbours works planned under this programme are additional shore facilities at Mombasa, designed to increase port capacity to match anticipated traffic demands. The works are mainly required to enable two of the Kipevu berths to be brought into service, after completion

of the four quay walls which are now under construction.

Concern was expressed by the Council at the extent of rail-and-road competition and the difficulties experienced in maintaining favourable railway rates for primary agricultural and export products, if other more highly rated traffic were diverted from rail to road. It was proposed that, in view of the importance of the problem and its repercussions on the economy of East Africa, the High Commission should be recommended to appoint an independent commission of inquiry from outside East Africa to enquire into, and report on, the whole question of such competition, how it was to be met, and what was best for the three territories, that the inquiry should be on an overall East African basis, and that particular reference should be made to the effect of the differential railway tariff in relation to the policies of the Governments of the East African territories.

The immediate ordering was recommended of 10 diesel locomotives at a cost of £825,000 to replace worn-out steam locomotives. The Council also recommended the ordering of a new ship for Lake Victoria. This will be built in Britain and shipped to East Africa in pieces for re-erection at Kisumu, and is expected to be in service by the end of 1960 or early in 1961. The ship will provide a faster and more frequent service than the present vessels, and will enable E.A.R. & H. to provide much better facilities for passengers than has hitherto been possible. Construction was advocated of a new lake port at Mwanza South in conjunction with the Tanganyika Government, to increase capacity on the services at the south end of Lake Victoria, and permit the existing, confined port at Mwanza South to be used solely for passenger ships.

It is clear that lack of capital is precluding the much more comprehensive development that East African Railways need if they are to increase their capacity so as to enable them to cater adequately for the economic development of the three territories. A great deal has been done by the railway management to augment and increase the equipment available—in the acquisition of motive power and rolling stock, for instance, and in installation of modern signalling; but much more remains to be done, and more capital is needed for a long-term plan.

### Rhodesia Railways

**T**HE report of Rhodesia Railways for the year ended

March 31, 1956, signed by Lt.-Colonel H. B. Everard, the General Manager, is presented in a new and attractive style which should be welcomed by the public of the Federation. The period under review was the tenth year of postwar growth and expansion, and the report gives comparative figures to show the extent to which traffic has grown. Revenue from all services rose from £6.35 million in 1945-46 to £24.16 million in 1955-56. Expenditure grew from £4.68 million to £20.28 million. The staff increased from 4,713 to 9,903, locomotives from 213 to 389, coaching stock from 379 vehicles to 593, and wagons from 4,434 to 9,687. Passenger traffic improved from 2.63 million to 3.89 million and freight tonnage grew from 4.15 million tons to more than 10 million. These figures show clearly the efforts made by Rhodesia Railways to keep pace with the expanding economies of the Rhodesias.

Expenditure on fixed assets at the end of the year had risen by £5,392,666 to £77,248,604. Despite the amount of development work already done, the report states that much more will be necessary, requiring considerable financial resources, if the railways are to have adequate capacity to carry the traffic expected in the future. Revenue continued to increase during the year, mainly because of extra general merchandise and mineral traffic. Record results were obtained from coaching, general merchandise, and mineral (including coal and coke) traffics, and from road motor operations. Expenditure, however, was higher and the balance on operating, at £3,878,993, was £616,130 less than in 1954-55.

One of the important events of the year was the opening, on August 1, 1955, of the new line connecting Bannockburn with the Portuguese East Africa line to



Lourenço Marques, providing an alternative to the Beira route to the East Coast. Part of the export traffic in copper and asbestos and certain import traffic was diverted to the new line, easing the burden on the Port of Beira and the Salisbury-Umtali section of the railways. Because of speed restrictions during completion of ballasting, no passenger trains were run on the line during the period under review, but the initial single daily freight train was increased to two, Beyer-Garratt "15th" class locomotives being used on these 1,000-ton trains between Bulawayo and the border station, Malvernia. In January, 1956, discussions were held between representatives of the Benguela, Bas Congo-Katanga, and Rhodesia Railways on the greater use of the Lobito Bay route as a subsidiary channel for goods to and from the Federation.

The report comments on the continued expansion of competitive road services and further amalgamation of road transport interests. Inroads into local traffic are increasing, but more serious is the interception of high-rated import traffic at Umtali, Beitbridge, and Bulawayo. The road services, with their door-to-door collection and delivery, are regarded as such serious competitors that a Road Competition Officer has been appointed in an endeavour to reduce the amount of traffic attracted away.

Apart from the new South East Railway already mentioned, there were other track works of importance. The Mpopoma Yard was opened fully on May 1, 1955, and on the same day the double line between Bulawayo and Cement was opened and the old line closed, thereby converting Bulawayo into a terminal station. The double line is equipped with automatic colour-light signalling and has no level crossings. Mpopoma Yard has a fixed radio station and a number of "walkie-talkie" sets for use by the yard staff. Deviations between Dett and Wankie were completed in July, 1955, permitting an increase to 1,300 tons in weight of the normal banked freight load, compared with 785 tons previously. The use of C.T.C. was extended to the Dett-Kennedy section as the first stage of eventual introduction between Mpopoma and the coalfields area. A contract was let for similar work between Thomson Junction and Livingstone. Construction of the 13-mile line between old Chingola and the Bancroft Mine was completed. Earthworks and tracklaying on the Wankie avoiding line from Mbarira to Thomson Junction were also completed. Work on bridges included the raising of the Kafue Bridge by 7 ft., the completion of a new bridge over the Umniati River, replacement of the Mapepi Bridge, and the bridge over the Upper Kafue River on the Bancroft line. Additional crossing loops were provided to increase the carrying capacity of the Vryburg-Bulawayo line, and a number of existing loops were extended.

The locomotive stock rose by 14 to 389 at the end of the year. Two shunting locomotives were withdrawn and 16 diesel-electric locomotives put into service. Freight rolling stock increased to 9,687 vehicles, and 300 high-sided steel wagons were put into service. Locomotive maintenance costs increased from 13.75d. to 15.66d. per engine mile, and coaching maintenance showed a similar proportionate increase. Wagon maintenance costs rose by 15.2 per cent. The following table gives some of the more important results:—

	1954-55	1955-56
Miles open	2,500	2,687
Gross ton-miles (thousands)*	7,981,975	8,767,243
Average haul (miles)*	411	407
Train-miles*	11,454,234	11,862,954
Engine-miles*	14,076,890	14,902,542
Tonnage conveyed:		
General merchandise	3,932,222	4,387,330
Coal and coke	3,125,762	3,332,117
Minerals	2,048,523	2,345,684
Total	9,106,507	10,065,131
Total passenger journeys	3,784,692	3,982,761
Receipts:	£	£
General merchandise	11,495,223	13,103,432
Coal and coke	2,550,256	2,783,520
Minerals	4,397,221	4,929,753
Coaching	1,945,208	1,987,600
Road motor	626,036	679,088
Total revenue	21,758,662	24,160,000
Total expenditure	17,263,539	20,280,000

\* North of Bulawayo

## Letters to the Editor

(The Editor is not responsible for opinions of correspondents)

### Unprofessional Conduct

September 23

SIR.—The article in your September 13 issue, deploring a recent proposal to seek payment for overtime on behalf of middle and senior grade officers in the British Transport Commission, must surely represent the views of the majority of members of the professions affected. Such proposals show a lack of understanding of the position of the professional man and of his attitude towards his work.

The professional engineer is a part of the management team and his hours of work are determined not on a direct time basis, but by the requirements of the position which he holds. The task of raising the status of the engineering profession, which is a principal aim of the Engineers' Guild, cannot be achieved by such tactics; indeed, as you point out, they are likely to have the opposite effect.

At the same time, there is little doubt that proposals of the kind in question spring from a knowledge that the salaries of the officers concerned are still inadequate. One difficulty hitherto has been the low ceiling imposed by the Government in fixing the salaries of the Chairman and Members of the Commission. Following the Prime Minister's announcement in July, this ceiling has now been raised substantially and the Guild hopes that the opportunity will be taken to carry out a review of officers' salaries with particular reference to the nature and extent of the responsibilities which they bear.

Yours faithfully,

J. G. ORR  
Secretary

The Engineers' Guild Limited,  
78, Buckingham Gate, S.W.1

### Another Fast West Coast Run

September 22

SIR.—Another remarkable performance was that of the southbound (Glasgow Central to Euston) "Caledonian" last Friday. Because of a derailment at Shap summit, single-line working had to be put in force between Shap and Tebay, so that on passing Oxenholme the train was 51 min. late.

Notwithstanding a permanent way slack at Galgate, plus one severe and four minor signal checks, worth in all 8½ min., the engine crew succeeded in recovering 18 min. of the arrears. Features of the run were an average of 81.8 m.p.h. over the 36.2 miles from Rugeley to Brinklow and the even higher one of 85.5 m.p.h. between Welton and Wembley (67.2 miles); all delays included, our average speed from passing Oxenholme to arriving at Euston was 69 m.p.h.

Locomotive No. 46239, *City of Chester*, hauling the normal load of 8 vehicles, 264 tons tare, was in the charge of Driver R. Court and Fireman L. Virgo of Camden, and the whole *tour de force* provided a further example of the endurance and steaming capacity of this superb Stanier breed, and also of highly skilful handling by top-link enginemen.

Praise must be given also to the operating authorities for keeping the road so clear in the circumstances, and to the civil engineers for the high standard of permanent way maintenance, evidenced by impeccably smooth running throughout.

Yours faithfully,

J. E. L. SKELTON

9, Keble House, Manor Fields, Putney Heath, S.W.15

## THE SCRAP HEAP

### High-Speed Tourism

Among the passengers on the inaugural trip of the "Fair Maid" from Kings Cross to Scotland on the East Coast route last week was a tourist from the U.S.A. A car was waiting for him when the train reached Edinburgh at 2.36 p.m. He then visited the main tourist attractions and was back at Edinburgh Waverley in time to return on the up "Talisman," leaving Edinburgh at 4 p.m. He explained that he was in London for three days and his womenfolk had decided to make that day a shopping day.

### Travel in Manchuria

To appreciate the flavour of Manchuria, an elusive combination of garlic, carbolic and nursing babies, one must . . . travel by train, as I did from Harbin to Mukden. Broadly speaking railway journeys in China are slow, largely owing to out-of-date locomotives and newly laid track. They also involve the maximum amount of noise. All day and most of the night loud-speakers in every carriage keep up a steady barrage of news broadcasts, political lectures, exhortations to comrades to keep the train clean, and excerpts from the Peking opera. To untutored ears the last-named sound like a musical score for "Cat on a Hot Tin Roof." They are delivered 90 per cent of the time in a female voice with saw-tooth edges. It sounds like the quacking of a demented duck. . . .

The train staff, who to the fevered imagination seem to number about 10 per cent of the passengers, incessantly

sweep up pieces of paper and cigarette ends, swab down the compartments with wet mops. . . .

The dining car is always full. Customers return again and again for a little something to keep body and soul together. Not only this, but at every halt itinerant vendors of sausages, roast chicken, dumplings, buns, cakes and bread, clad in white coats and surgical masks, have their stalls besieged by packed ranks of travellers who lay in a large supply of edibles to last until the next station.—Ossian Goulding in "The Daily Telegraph."

### Terror in the Tunnel

Between them, diesel and Pullman will ultimately put an end to one of the hazards of railway travel, that of the lone female who found herself travelling in a compartment with a lone male when the train entered a tunnel and the lights failed to come on. One of my friends prepared for this eventuality by always carrying a ladylike club in the shape of a "chubby" umbrella. When, as the old song has it, "Into the tunnel quite, into glorious darkness, black as Egypt's night" they went, she immediately seized her weapon and waved it vigorously back and forth in front of her. Sometimes the lights came on unexpectedly and her terror was transferred to her companion who must have thought he was travelling with a very suspicious character, as indeed he was, though she could hardly explain what her suspicions had been without adding insult to obviously contemplated injury.—From "The Manchester Guardian."

### Opposition to Railways

Though it is barely 20 years since railway travelling was first introduced into this country, and scarcely half that time since it was finally accepted as a safe and becoming method of locomotion, people have probably forgotten altogether that this marvellous invention was actually encountered with all the opposition that wealth, rank and bigotry could contrive to create. . . . There was no catastrophe which was not predicted as an infallible result if his maniacal proposals should be countenanced by Parliament . . . when next any projected reform is coupled in public discussion with the ruin of the country, the destruction of important interests, and the decay of England's most valuable characteristics, it may conduce to the assurance of the nation, and perhaps to the facilitation of progress, if we remember the reception given to railways, and the history of George Stephenson.—From "The Times" of September 19, 1857.

### High-Speed Line

Many years ago a class of 4-6-0 locomotives built by the Brooks Locomotive Works, one of the forerunners of Alco, for the Lackawanna Railroad, had a notorious reputation for poor steaming and bad riding, sometimes taking 30 hours for a 100-mile freight run. According to local tradition one of them on a heavy freight reached Port Morris, N.J., at the same time as a canal boat it had run alongside 30 miles back. "You've made a pretty fast trip, haven't you?" said the driver to the canal pilot. "Wal," was the reply, "we'd have done better if we hadn't had to tie up at Hackettstown for a couple of hours to get a new tow-mule. One of ours died."

### Fast Workers

(See last week's issue)

Greetings to these charming ladies,  
Typewriters and all, to boot,  
Who set out, prepared for action  
Secretarially en route!

This should boost up railway travel,  
North and south and east and west;  
Let the air-lines have their ladies,  
B.R. secretaries are best.

See the tycoons rush for "seasons"  
To put through their high-speed deals,  
Per pro these efficient damsels  
In their offices on wheels!

In this latest exposition  
Of railborne efficiency  
I've a yen to be a part of  
The dramatis personae.

I could keep the office tidy,  
Stick the stamps on, P.D.Q.,  
And, what's even more important,  
Make a decent cuppa, too.

A. B.

### A Fairlie on the Festiniog Railway



The Fairlie double-engine "Taliesin," recently rebuilt by the Vulcan Foundry Limited, at Blaenau Festiniog in 1890, when it bore its original name "Livingston Thompson" (see page 735 of our June 28 issue)

## OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

### RHODESIA

#### Lorries for Fruit Transport

Large-capacity 24-ton gross eight-wheel lorries, 31 of which have been ordered by the railway administration from Leyland Albion (Africa) Limited, are being placed in service on various types of haulage, the latest being the transport of fruit and vegetables. They are Leyland Octopus vehicles, powered by 150-b.h.p. diesel engines, a type that has been adopted by the Rhodesia Railways road motor services as the basis for its general purpose goods vehicles. Used with six-wheel trailers, some of the machines are already hauling 24-26 head of cattle from the ranching areas to cold stores in the towns. Others are employed in transporting bagged sugar.

They have covered insulated bodies of light-alloy construction, water-proofed throughout. Double sides, ends and roof, have been insulated with fibre glass. Doors have been made airtight to maintain a controlled coolness inside the vehicle. All alloy parts have been cleaned and left in their natural state, but steel parts and timber fittings are painted.

### EAST AFRICA

#### Skew Overbridge Near Mombasa

To provide the new Changamwe station, goods yard, marshalling yard and industrial sites, near Mombasa, with public approach, a road has been constructed crossing both the Nairobi main line and the branch leading to

Kipevu deep-water berth construction works. The two lines are here running side by side and the crossing is effected by the construction of a two-span skew overbridge in concrete. The bridge has been built without any interruption to rail traffic and was recently completed.

#### Record Traffic on Lake Victoria

Record tonnages are being carried by units of the E.A.R. & H. inland marine fleet on Lake Victoria as the result of heavy coffee crops in Uganda and the Bukoba area of Tanganyika and a record cotton crop in the Lake Province of Tanganyika. Other traffics moving in quantity are cement, machinery for mining projects east of Musoma, and maize and sugar from Uganda into Tanganyika, while there is a sustained demand for transport capacity for cargoes of a general nature.

### SOUTH AFRICA

#### Increase in Passenger Traffic

Returns now available in respect of the financial year which ended on March 31, show that during the year 1956-57 the S.A.R. carried 267,794,870 passengers compared with 262,164,867 during the previous financial year. This substantial increase is not as satisfactory from the railway point of view as it would appear, as first class suburban passengers increased by only 285,493, while second class suburban passengers declined sharply by 727,700, from 44,914,852 in 1955-56 to 44,187,152.

The most arresting feature of the passenger trend last year was the sharp

rise in non-European third class suburban travel; from 128,829,108 in 1955-56 to 135,531,655 in 1956-57, that is by 6,702,547 for which the expansion of the native residential areas on the outskirts of some of the larger cities can be held accountable. The total number of third class passenger journeys recorded during 1956-57 was 154,392,826, an advance on the previous financial year of 6,644,610.

#### Improvements in Pretoria

A new administrative building for the office of the System Manager of the Eastern Transvaal System at Pretoria, improvements to Pretoria passenger station, doubling from Capital Park via Koedoespoort to Eerste Fabrieke (13 miles), installation of colour-light signalling with electrification of the new double track and the construction of several new lines, are among the modernisation and expansion plans for the Pretoria district.

### CANADA

#### Progress on New C.N.R. Branch

The Canadian National Railways has awarded the final contract for work on the 294-mile branch line from Beattyville, about 75 miles from the Quebec-Ontario border, past the new mining camp town of Chibougamau to St. Felicien, about 250 miles north-east of Montreal on Lake St. John. Work is in progress on the other 65 miles of the eastern section between Chibougamau and St. Felicien.

Ore and pulpwood have been moving over the western section between Beattyville and Chibougamau, but some lifting and resurfacing remains to be done before the section is opened this autumn. Completion of the entire branch is expected in 1958.

The new line will open up an area where mining and timber companies have scarcely begun to exploit the natural wealth. Four mines producing copper and gold are in operation in Chibougamau and several more are due to reach production after the railway is completed.

### UNITED STATES

#### Burlington Streamline Trains

The new sets of cars introduced on the "Denver Zephyr" of the Chicago, Burlington & Quincy Railroad, the high-speed overnight service between Chicago and both Denver and Colorado Springs which now includes "roomette" sleeping cars for "coach" passengers, have made it possible to transfer the previous train sets to the "Texas Zephyr" service, between Denver, Colorado Springs, Fort Worth, and Dallas. The latter 12-car trains, each of which includes a coach lounge and



Changamwe Road skew overbridge near Mombasa, crossing the Nairobi main line and the branch to Kipevu



a full-length parlour-observation lounge, have been completely renovated and the schedule has been cut by an hour in each direction.

The Burlington was responsible for introducing in 1934 the first diesel-driven stainless steel streamline train in the U.S.A., the articulated three-car "Pioneer Zephyr," which preceded its introduction into daily service over the 210-mile route between Kansas City, St. Joseph, and Lincoln by a non-stop trial run over the 1,017 miles from Denver to Chicago at an average speed of 77.6 m.p.h. After 23 years, during which this unit has covered several million miles, it has just been returned to its original route and once again is covering 366 miles daily from St. Joseph to Lincoln and back.

#### Union Pacific Freight Terminals

Two major freight developments are being started by the Union Pacific Railroad, at the extreme ends of its system. In the north-west, all the U.P. freight handling and servicing in the Portland, Oregon, area is to be concentrated at the Albina yard, which is to be rearranged by laying in 68,000 ft. of new track and relocating 151,000 ft. of existing tracks. The completed yard will have in all 53 tracks, six of which will be long enough to hold 140 bogie wagons each. The additions will include a three-track wagon repair shed 1,000 ft. long, a four-storey yardmaster's office and observation tower, a freight depot and diesel servicing facilities.

The other developments are to be at Kansas City. Here a steel freight depot, 946 ft. by 167 ft., is to be built, equipped

for mechanised freight handling, also a diesel servicing building of steel, concrete and glass block construction, 260 ft. by 138 ft. In addition there are to be a 250 ft. outside diesel inspection pit, a new two-storey office building, and a considerable extension of the yard trackage. The work on both projects is expected to take two years to complete.

## FRANCE

### Reducing Wagon Turnround

Compared with 1954, the average number of wagons loaded daily on the S.N.C.F. has gone up by 20 per cent, and this rate of increase is expected to continue. To obviate the necessity for a proportionate increase in wagon stock, considerable efforts have been made in recent years to improve wagon user. As a result of changes in the tariff structure, the average wagon load has gone up from 9 tonnes in 1938 to nearly 15 tonnes. New regulations have been introduced as to the free period for loading and unloading wagons, while the basis of demurrage charges has been changed.

Under the new regulations, the hours at which the free period commences varies according to the frequency with which the stations or sidings are served by freight trains or transfer trips. At stations the free period may commence at any time during the day and may vary according to local circumstances, time of advice, and so on. In a similar way the free period for private siding traffic may vary according to the category of the siding.

Demurrage charges at S.N.C.F. stations were formerly quoted on a half-day basis, the charge varying according to the season of the year. Under the new arrangements, there is a standard charge per 24-hr. period of 700 francs with a rate of 1,400 francs from September 16 to December 31 and a reduced rate of 300 francs from July 15 to August 31. The 24-hr. rate is indivisible. Reduced charges apply for private siding traffic, and for certain categories of sidings there is an hourly rate with a minimum as for 4 hr. In quoting these amended rates, the S.N.C.F. has stressed that these charges are not to be regarded as a penalty but as a payment for additional services rendered.

### Icing of Wagons at Perpignan

Reference was made in our issue of December 11, 1953 to the special icing tower constructed on S.N.C.F. property at Avignon and Perpignan by the Société des Transports et Entrepôts Frigorifiques (S.T.E.F.), 90 per cent of whose share capital is owned by the S.N.C.F. During the summer season 50-60 wagons a day are iced at Perpignan, while in the winter season the daily average rises to nearly 90. In the summer, the average amount of ice required by each wagon is 3 tonnes, but during the winter 2 tonnes suffice. Inclusive of sales to the public, the Perpignan installation manufactures some 180 tonnes of ice daily.

In addition, S.T.E.F. maintains a large cold store at Perpignan for the storage of fruit and vegetables

## Publications Received

*The Development of Electric Railway Rolling Stock.* By G. T. Moody. No. 3 of a series of booklets issued by the Electric Railway Society.—Because the scrapping of original electric stock is almost completed and references thereto are widely scattered, this 12-page booklet has been prepared. A short description of both underground and surface stock, arranged in chronological order, traces the development of this type of vehicle in this country. Copies of the booklet are obtainable, price 1s., post free, from the Society, 113, Abbotts Park Road, London, E.10.

*Il Treno in Casa (The Train at One's Door).* Rome: Italian State Railways, Piazza della Croce Rossa. 96 pp. 8½ in. × 4½ in. Illustrated. No price stated.—With the aid of an excellent set of illustrations, this publication, No. 8 of a series of Italian State Railways booklets, traces in detail the evolution of door-to-door freight facilities as provided by railways. After a brief historical introduction and references to the bringing of rail communication into ports and, by means of the private siding, into industrial establishments, and to the equipment used therein, the origin and development of the container

idea and the consequent endeavours of railways to overcome the limitations of the fixed track are dealt with, with particular reference to Italian conditions. The international aspect of the question and the discussions held upon it at various congresses and other meetings are referred to, with descriptions of types of transporter truck adapted to overcome breaks of gauge or carry rail vehicles along roads, including such special examples as those met with on the Geneva tramways. The carriage of cement in bulk, of private motorcars, ferry and road-railer services, and the vehicles designed for them find adequate notice and the work concludes with specimens of Italian regulations on container and associated traffic and a list of over 60 articles and reports on this subject.

*Track Maintenance Equipment.*—A leaflet issued by Beyer, Peacock Railway Equipment Limited, Locomotive House, Buckingham Gate, London, S.W.1, describes a range of machines for track maintenance manufactured in U.S.A. by the Railway Maintenance Corporation of Pittsburgh, U.S.A. The British company has been formed to market these machines in the sterling area and other countries, as Beyer, Peacock & Co. Ltd. has recently con-

cluded a licensing agreement with the Railway Maintenance Corporation to manufacture Corporation machines in this country. The leaflet describes and illustrates machines for, inter alia, spiking, ballast cleaning, track slewing, tamping, and trench digging. Many of these are in service on U.S.A. railroads. Their use makes possible a considerable reduction in track maintenance costs, and at the same time a good track is maintained for long periods without the necessity for further heavy maintenance.

*Winter Sunshine.*—This attractive, copiously illustrated booklet contains, as it states "one-hundred-and-one ideas for winter holidays which can be arranged by Thos. Cook & Son Ltd." Besides the shores and islands of the Mediterranean, the Italian Lakes, Portugal, Spain, and North Africa—all long since frequented by winter holidaymakers from Britain—tours can be arranged, mainly because of the speed of air travel today, to places as diverse as the Belgian Congo, Ceylon, Chile, Ghana, India, Israel, Mauritius, New Zealand, Rhodesia, and Uruguay. Railway travel is included in the Congo, East Africa, Rhodesia, the Union of South Africa, India, Argentina, and Chile.

## Diesel Maintenance Depot at Darlington

*Servicing multiple-units in North Eastern Region*



*View of depot showing (left to right) staff accommodation block, stores block, and south entrance to running shed*

**T**HE depot built to service the multiple-unit diesel trains working in the Darlington area of the North Eastern Region was opened on September 17 by Mr. G. R. H. Nugent, Parliamentary Secretary to the Ministry of Transport & Civil Aviation, as recorded in our September 20 issue. Some details of these services, both in operation and planned, were given in our issue of May 11, 1956. When in full operation they will require 130 vehicles, all of which will be based on the depot.

The depot has been constructed on a site immediately to the north of Darlington passenger station and will form part of the main motive power depot which is situated on the opposite side of the main line. The new depot will be the responsibility of the present shedmaster, through an assistant.

The depot consists, in addition to a running shed, of a totally enclosed and heated repair shop, a two-way carriage washing plant, a paved and drained area for cleaning, accommodation for stores, as well as amenities for some 130 staff.

The running shed has three through roads and the repair shop two, each capable of holding a four-car set. Both these buildings are of reinforced concrete frames carrying pre-stressed concrete main roof beams with patent glazing and brick apron walls. Main concrete beams were supplied by Costain Concrete Co. Ltd., and secondary pre-stressed beams by Dow-Mac (Products) Limited. The roof glazing, carried out by H. W. Heywood & Co. Ltd., comprises 70 per cent of the roof area and is supported on a system of pre-stressed concrete chan-

nels incorporating drainage and walkways. Twenty-seven individually-controlled electric Vent-Axia 12-in. dia. extractor fans, to ensure freedom from diesel fumes, are installed. All tracks in both the running shed and repair shop are provided with full-length inspection pits. These are equipped with bulkhead lighting and panel heating, also compressed air points. The rails are carried on elevated beams.

Four fuelling points have been installed, two at the extreme north end

of the depot yard, spaced so as to enable both front and rear tanks to be fuelled simultaneously. The other two fuelling points are at the north entrance to the running shed. Fuel storage of 7,000 gallons is provided.

The carriage washing plant uses four pairs of rotating rag flails and will be capable of dealing with the whole of the diesel units as well as steam stock used for mail-line trains.

Outside cleaning facilities have been provided on a paved and drained area at the south end of the depot. Five open roads well equipped with water hydrants for exterior cleaning, and electric power points for vacuum cleaning of coach interiors enable 36 vehicles to be cleaned simultaneously.

### Staff Amenities

The staff accommodation block consists of a two-storey reinforced concrete-frame building. It includes toilets, locker and drying rooms, mess-rooms and kitchens, with an adjoining single-storey wing in load-bearing brickwork housing offices and small workshops. Extensive use has been made of curtain walling, infilling panels consisting of fluted asbestos sheets painted in contrasting colours, grey aluminium-faced Asbestolux, and clear sheet glass. The internal fittings and furnishings and the varied colour schemes adopted are designed to provide a restful atmosphere for staff in off-duty periods.

The stores block which abuts the south end of the repair shop contains the oil-fired boiler at basement level



*Glazed roofing, lighting and inspection pits in interior of running shed*

and is of the more conventional brick construction, well glazed, and incorporates exposed aggregate panels below window level. Sectional metal racking and storage compartments for small spare parts are installed in bays in the main storeroom, whilst an overhead steel gantry and hoist blocks have been provided for the heavier spares. Electric lighting has been provided both within the various buildings and over the whole of the outside area where staff will be required to work.

As the depot adjoins the main line on the down side, a tubular steel footbridge with concrete decking, 6 ft. wide, with spans of 30 ft., 150 ft., and 70 ft., has been built to connect it with the parent motive power depot on the up side.

The main contractor for the running shed and repair shop was A. Monk & Co. Ltd.; for the staff accommodation and stores block, R. Blackett & Sons Ltd.; and for the tubular steel footbridge, Tubewrights Limited.



*Above: The paved and drained cleaning area which can accommodate 36 vehicles*



*Left: An eight-car diesel set serviced by the depot, at Darlington Station*

**CASH AWARDS FOR SAFETY SUGGESTIONS.**—Prizes of £15, £10, and £5 for the best suggestions for preventing accidents while on duty are being offered to the staff by the London Midland Region. The competition is part of the Region activities to promote interest in accident prevention in connection with National Industrial Safety Week, September 30 to October 5. Staff are invited to send in safety suggestions covering seven different categories of railway work, ranging from engine driving and permanent way work to freight and parcels handling and workshop practice. During National Industrial Safety Week the Region is arranging exhibitions, demonstrations, and talks to the staff, and there will be special displays of posters. In a message to the staff Mr. David Blee, General Manager of the London Midland Region, draws attention to the personal side of accident prevention: "Every accident," he states, "means suffering and loss to the man and his dependants, and it behoves every one of us to do all we can to prevent accidents of any kind. During 1956 more than 50 per cent of injuries to staff were due to accidents for

which the injured persons themselves, or their colleagues, were directly responsible. This demonstrates clearly the duty we owe to ourselves and our fellow workers."

**RECONSTRUCTION OF WHITLAND STATION.**—Work has started on the reconstruction of Whitland Station, Western Region, British Railways. To maintain normal public facilities whilst the rebuilding is being carried on, temporary huts have been brought into use to replace the old buildings which are in course of being demolished. When completed, the public accommodation will be contained in a single-storey structure facing the forecourt, and a covered entrance will lead through a ticket hall to the up platform. In the adjoining waiting room, separated by a glass screen, refreshments will be obtainable. Passengers will also be able to obtain refreshments on the platform, which will be covered by a 320-ft. canopy. The ladies' waiting room, lavatories, and the stationmaster's office will be on the platform side of the building. Parcels traffic will be handled in a large office having doors to both forecourt and plat-

form. A separate building to the east will contain the District Inspector's office and stores. On the down platform, a new refreshment room and new lavatories will be built under a 270-ft. canopy. Many of the components used in the work will be pre-fabricated to allow speedier construction. The main buildings will have a central heating and hot water system. Platform canopies will be of steel and aluminium. This station has been designed in the Architect's Section of the Chief Civil Engineer's Office, British Railways, Western Region, under the direction of the Regional Architect, Mr. H. E. B. Cavanagh.

**FURTHER ELECTRIFICATION IN WESTERN GERMANY.**—On September 26, single-phase electric operation began between Würzburg and Aschaffenburg, including the well-known 1 in 40 incline east of Aschaffenburg. Electric traction is not entire at this stage, but in the next few months will become so except for the long-distance diesel-hauled trains and fast diesel-railcar trains which run over the route.



## New South Station in Vienna

*Rebuilt terminus, replacing facilities destroyed in the war, serves southern and eastern main routes at different levels*



*Interior of the main hall of the new Vienna South Station, showing stairs and escalators to the eastern section lines*

THE recent bringing into service of the new South Station in Vienna, rendered essential by the extensive war damage to the railway installations in the city, may be said to be an outcome of discussions which began before the war of 1914-18, when a commission was appointed to investigate, in consultation with the municipal authorities, the possibility of a large central station and eliminating some at least of the others (mostly termini) then in use.

To construct such today would cost a prohibitive sum and it was therefore decided to concentrate main-line passenger working as far as possible in the West Station (Westbahnhof)—which terminus has also been rebuilt since the last war, and a new one combining the functions of the former East and South Stations (Ostbahnhof and Südbahnhof) where the original South Station stood, as it was impracticable to rebuild the latter. In con-

junction with the Westbahnhof this new South Station will take practically all the long-distance traffic and a considerable proportion of the local services also.

The replanning of the connecting line (Verbindungsbahn) will give a convenient link between the two termini. The South Station proper is the terminus of the main line of the former Südbahn (now in course of electrification) to Styria, Carinthia, the Adriatic, and Italy via the Semmering pass. From the East Station trains run to the Hungarian frontier at Hegyeshalom, and thence to Budapest. Through vehicles between Budapest and the West are worked over the Verbindungsbahn between the Südbahnhof and the Westbahnhof.

### Location

The new station is placed at the intersection of the main southern and eastern routes of the Austrian Federal Railway. One building is able now to meet all the requirements at considerably less operating cost and provide an appreciably better service to the travelling public than has been possible hitherto.

The railway authorities invited competitive designs and several were received from prominent architects and engineers, but as none was thought to meet the requirements completely it decided to adopt its own, which already had been drawn up. This was the work of the architect, Mr. Heinrich Hrdlicka, who had the

*(Continued on page 368)*



*Main frontage, showing, on left, restaurant terrace and eastern section platforms, and, on right, the southern section lines and part of old station retained for offices*

# ELECTRIC RAILWAY TRACTION SECTION

## Keeping Up Appearances

SINCE the assurance was given in the early days of the modernisation plan that expert advice would be taken in the styling of electric and diesel locomotives, two events have quickened speculation as to the outward form of the new motive power. The Hastings diesel trains were a special case dictated by the exigencies of loading gauge, but the disappointment that has been expressed at their appearance reflects the interest taken in this subject and recalls the fact that everything placed in service now is part of the "plan" in the public mind whatever its true antecedents. By chance the first of the 174 prototype diesel locomotives to be seen was one (Vulcan-English Electric) of the type "A" mixed traffic series; and while this achieved a smart outline for a single-cab design, it was not, by its nature, an answer to the question whether designers in the electric and diesel field will be able to maintain the high standards of appearance set in the British express steam locomotive.

The problem facing the stylist of an electric design is that the visible parts of an electric locomotive are not functional in the same way as the boiler, cylinders, and motion of a steam locomotive. He must try to express power and speed in an inert shell which encloses and conceals the apparatus giving the locomotive these attributes. The problem is not quite the same as in the design of motor bodywork, for the car is a private vehicle styled consciously to appeal to prospective owners. The locomotive designer must make a more abstract appeal than this. There is, however, some overlapping of methods. The centre-cab locomotive in its modern form, as seen on the Lille-Basle electrification of the French National Railways, recalls the postwar car with bonnet and boot of almost equal length. There has been no permanent return of the centre cab, however; so that the clear division between the enclosures for the crew and for the apparatus will have to be drawn by the arrangement of windows, portholes, ventilation louvres, and similar details. Window design has borrowed from motorcar practice in the drivers' windows of the latest S.N.C.F. 1,500-V. d.c. locomotives of class "9200," where they are continued round the body ends to the sides, providing a clear outlook and distinctive appearance in the same way as the large windscreen area and rear windows of modern saloon cars.

Colour and lining offer various possibilities of creating interest and are likely to be used more freely than experiments with streamlined body contours, for aerodynamic forms are so finely represented in modern aircraft, where they are essential, that they strike many as an insincere method of decoration for land transport. Two tones of one colour separated by lining can be pleasing, as in the "7100" class of the S.N.C.F. The downward curve of lining at the body ends to form a "V" is seen in many locomotives and in numerous forms. It appeared at least as early as 1937 in British-built (English Electric) locomotives for the New Zealand Government Railways (although the halves of the "V" were separated by a central cab door) and has attained by now almost traditional status. Another device is to broaden the lining at the body ends to produce a "wings" effect, as seen in one form in the illustration of a Metrovick New South Wales Government Railways locomotive on page 328 last week. No doubt designers are giving thought to other decorative ideas capable of similar variations.

At one time a "nose" at each end of the body was widely seen in British-built locomotives for abroad, and claimed justification partly because it accommodated auxiliary machines, and partly for its function in preventing a direct downward view of the track, so that drivers were not distracted by "sleeper flicker." The amount of high-speed running for long non-stop periods performed

today by locomotives without these appurtenances shows that similar objects can be attained by judicious positioning of the driving seat and shaping of a normal front-end contour. The "nose" may therefore be expected to decline in favour, at least in the British tradition.

Within recent weeks there has been a further example of how shipping companies show themselves aware of public interest in the appearance of their vessels by publishing artists' impressions as soon as work on a new ship is begun. A similar concession to the curiosity of the railway travelling public might not be out of place at this time.

## Glasgow Suburban Electrification

THE contract reported in our September 6 issue for overhead contact line equipment in the Glasgow area was the first of its kind to be announced under the British Railways 50-cycle programme for a self-contained zone which is not being developed as a pilot scheme for a main-line project. Work will be begun early in 1958 by Pirelli-General Cable Works Limited on the provision of foundations, the supply and erection of all structures, and the complete installation of overhead catenaries and contact wires on about 200 single track-miles in Stage 1 of the work. The catenary will be of 19/083 cadmium copper with a cross-section of 0.101 sq. in. (copper equivalent 0.082 sq. in.) and the single contact wire will be of solid grooved cadmium copper of 0.166 sq. in. cross-section (0.14 sq. in. copper equivalent), giving a combined copper equivalent cross-section of 0.222 sq. in. These dimensions are similar to the 25-kV. catenary of the S.N.C.F. Lille-Basle electrification, and the comparison of the copper equivalent cross-section with the 0.75 sq. in. of the Manchester-Sheffield and 0.6 sq. in. of recent 1,500-V. d.c. electrifications gives a practical illustration of the saving in copper expected from adoption of the high-voltage a.c. system. A further point of interest is that the same light copper section is being adopted throughout the scheme, although both 25 kV. and 6.25 kV., will be used; and it is likely, in view of the topography of the Glasgow lines, that the proportion of mileage at the lower voltage will be considerable. These are suburban routes, and the question of high-speed current-collection at 6.25 kV., with the possible necessity of a heavier overhead construction to handle the necessary pantograph pressure, will not arise in the first instance.

Lines to be electrified north of the Clyde from Queen Street Low Level run west to Helensburgh, via Clydebank Central and via Drumchapel, and east to Airdrie, with branches to Bridgeton Central and Springburn. South of the Clyde, the sections to be electrified from Glasgow Central Station include the Cathcart Circle with extensions to Neilston High, Kirkhill, and Shields. Sections to be undertaken in Stage 1 of the scheme were listed in our September 6 issue, on page 287. Steelwork for structures and associated items will total about 5,140 tons, comprising 1,950 tons for single-track broad flanged beam structures, 1,000 tons for welded rod portal structures of special design, 1,880 tons for lattice portal structures, and 310 tons of small part work.

Overhead construction for high-voltage a.c. systems is a subject in which British industry has been fully conscious of the need for liaison with countries where the course of electrification development has given opportunities for practical experience. In connection with the Glasgow contract, Pirelli-General will benefit from the agreement concluded in 1956 with Brown, Boveri A.G. of Mannheim, whereby there will be a free exchange of technical information between the two companies on the techniques of overhead systems.





# Design and Construction in Main-Line Electrification—1

*Preliminary investigations and surveys: preparation of a track plan*

IN major electrification schemes such as those being carried out in connection with the modernisation plan of British Railways, the investigation and survey of the track, the design of equipment, and the supply and installation of that equipment is often carried out by a sole contractor. In order to co-ordinate this work, the contractor establishes a site office, subdivided into sections, in the vicinity of the work, each section being responsible for a stage of the scheme.

Before work can begin on any electrification scheme, a basic requirement is that an accurate and up-to-date track layout plan has to be available of

the line to be electrified, to determine the location of overhead line structures and wiring detail. In many cases the available drawing may represent the original layout of the track, and work carried out, such as the provision, or relocation of new drainage, or the construction of new signals, crossovers, or points, may not have been indicated on the drawing. For the purpose, therefore, of electrification work it lacks full detail.

## Ground Survey

The method of producing a plan in a suitable form may be by ground survey. All structures and permanent

installations are noted and their distances measured in miles and feet from a datum mile post. The surveyor's notes are then examined, and the information used to produce a plan suitable for overhead equipment design.

The accompanying illustrations refer to the work at present being carried out by the British Insulated Callender's Construction Co. Ltd. on the line between Crewe and Manchester, London Midland Region, British Railways, although the method of work described may be taken as typical of any major electrification scheme.

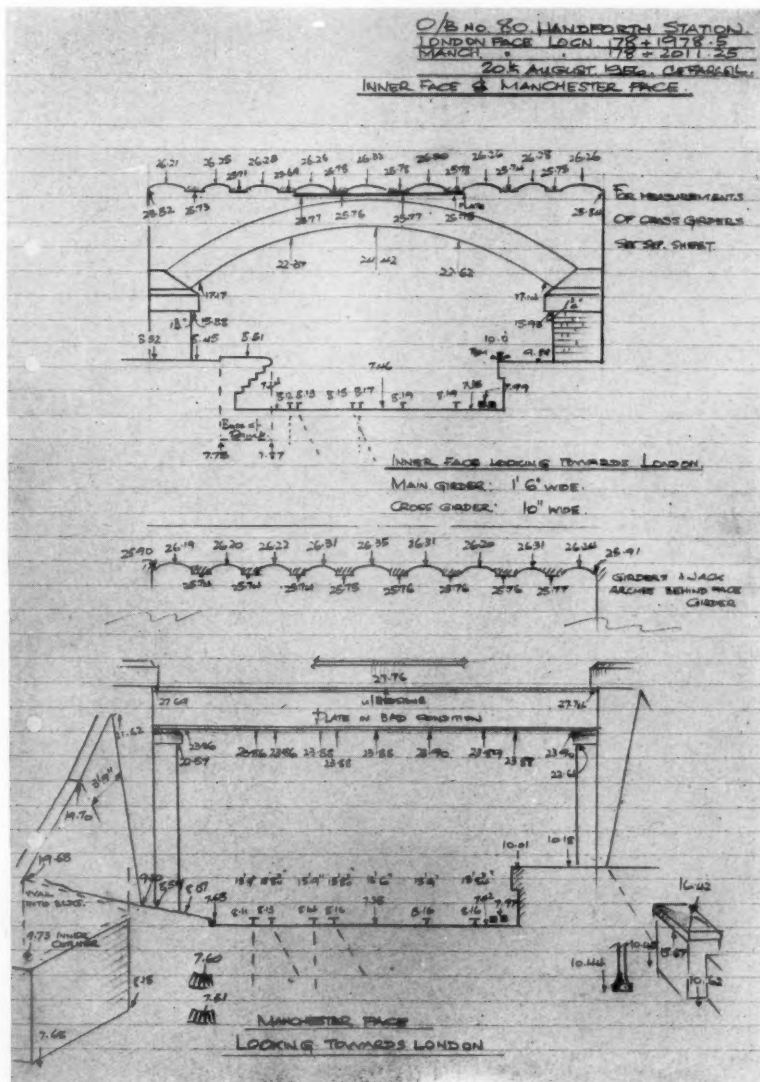
As an alternative to using the Civil Engineer's drawing, an aerial photo-



London face



Manchester face



A section of the bridge survey notes with photographs showing both faces and road surface of overline bridge No. 80 on Crewe-Manchester line

graphic reconnaissance can be made. A series of photographs is taken of a complete section of track, to provide a basis for a new track plan. This method is often quicker and cheaper than a full-scale ground survey, and although the resulting plan may not be so accurate as a ground survey, it is often sufficiently detailed for electrification work.

#### Aerial Reconnaissance

To prepare for an aerial photographic reconnaissance, scaling points are made along the whole length of track at intervals of 500 ft. by marking sleepers with white paint. This provides an identification mark which shows up clearly on the photographic print. It is also important that the position of permanent installations, which will to some extent determine the location of overhead structures, be easily identifiable in the photograph. These objects are painted in the same way as the scaling points, and include manhole covers, signalbases, toe of

points, and overbridge abutment bases.

The aerial fly-over is then carried out by an Aero Survey Sub-contractor and the area photographed in sections from which a series of prints are prepared providing a  $\frac{1}{2}$  overlap on each section. Variations in scaling may exist dependent on the angle of flight when each section was photographed, but by selecting the best portion of each print, a reasonably accurate plan can be obtained. The print is then enlarged to 132 ft. to the in. (2 chain) and a tracing is taken in pencil direct from the print; corrections are made from the pre-marking survey details, and a print of the tracing is then made.

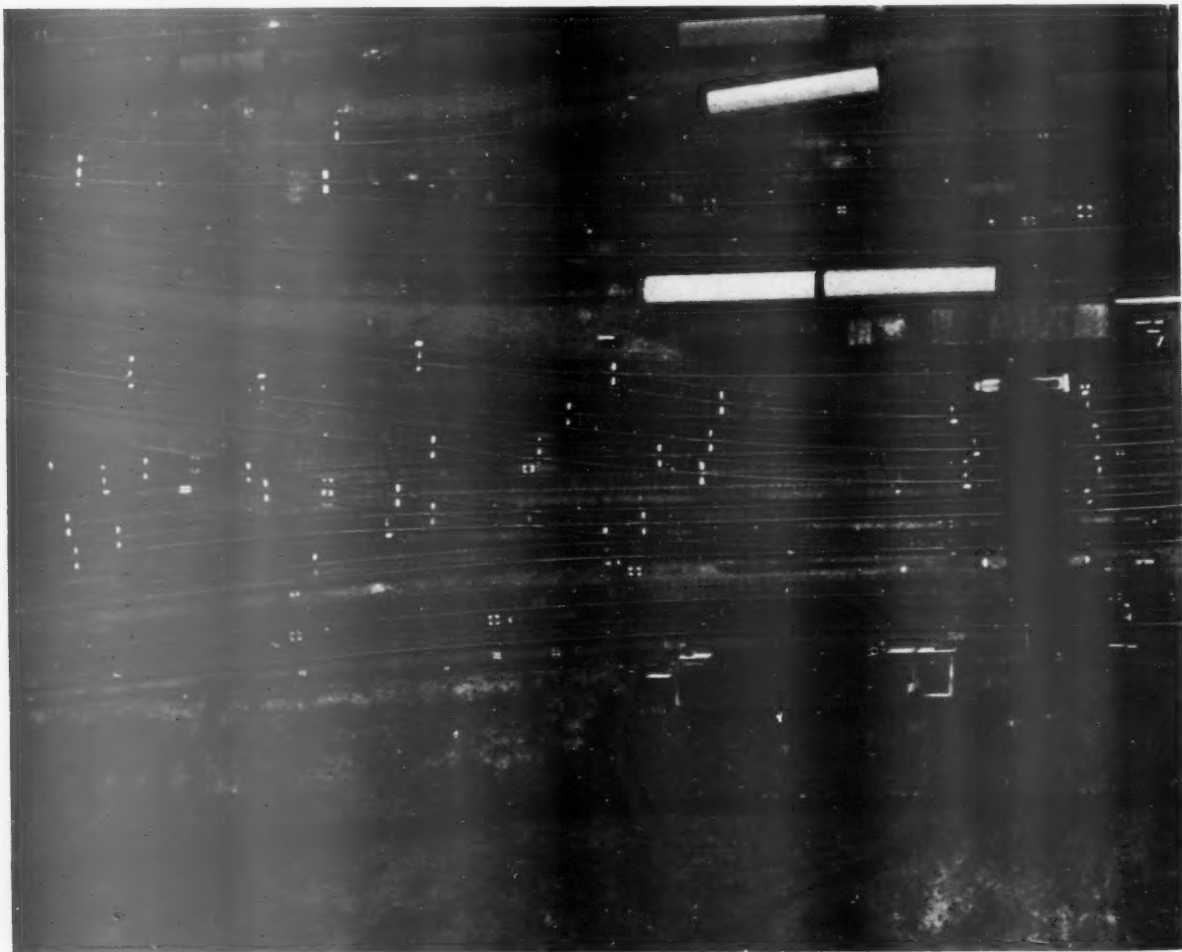
Using this print a surveyor walks along the track and quickly ties each of the points relevant to electrification into the main chainage scheme. His notes are examined by the layout draughtsman, who effects the necessary corrections to the original tracings. The pencil details on the tracing are inked in, and the plan is complete.

This method is suitable for open

track, but in wide junctions and complicated areas the tilt in the flight of the aircraft produces inaccuracies in scaling both along and across the track which cannot be disregarded. The concentration of lines, crossings, and points present difficulties in the location of overhead structures, and it is therefore important that the scaling should be as accurate as possible to present these objects in their true position on the final plan. A very much more careful analysis of the aerial photograph is therefore made and more detailed measurements are carried out when the field check is made on the preliminary tracing.

Junctions are normally presented to a scale of 40 ft. to the in. in view of the greater detail involved. If time permits, it is preferable to produce a plan from the photographs by using a photo-grammetric plotter. This is a high-precision optical instrument using a stereoscopic pair of photographs from which intersecting rays of light

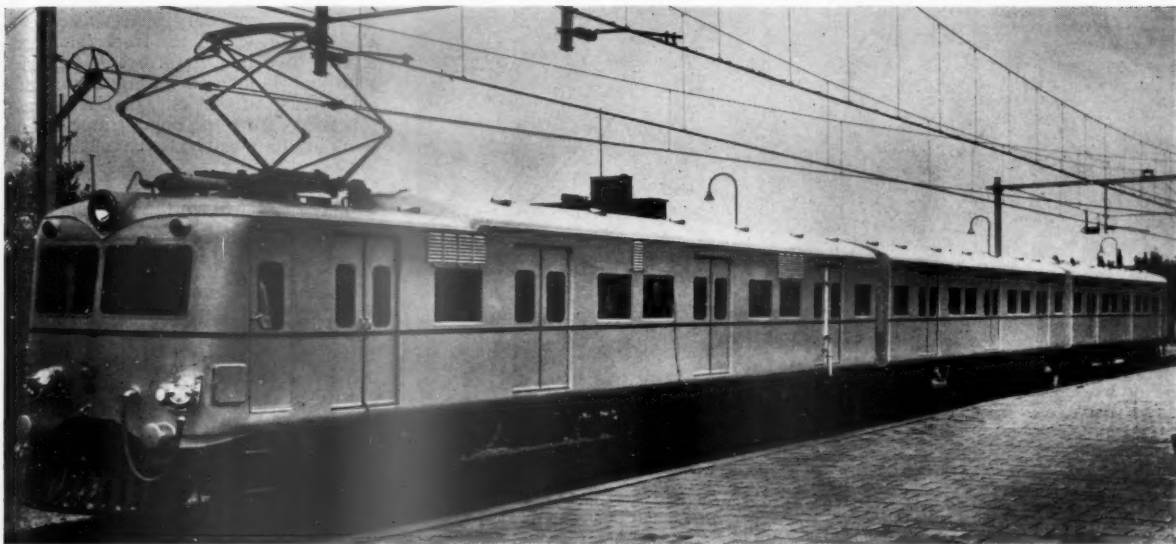
(Continued on page 367)



An aerial photograph of a junction, showing white painted markers indicating crossings, points, and manhole covers

## Electric Trains for Cairo-Helwan Service

*Direct-current 1,235-h.p. triple-car sets of integral construction for Egyptian Republic Railways 15-mile suburban line*

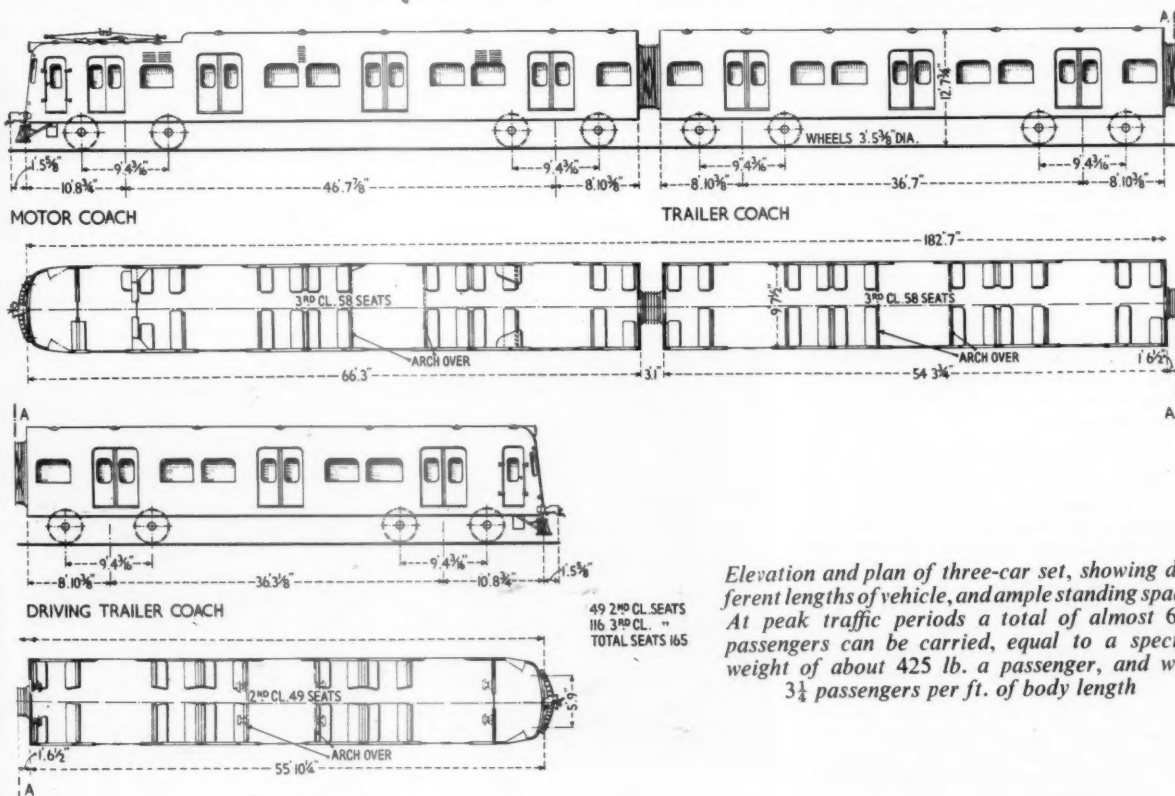


*Three-car set built by N. V. Allan & Company for Cairo-Helwan service*

AFTER being operated for many years by steam locomotives and then by diesel railcars, the 15-mile

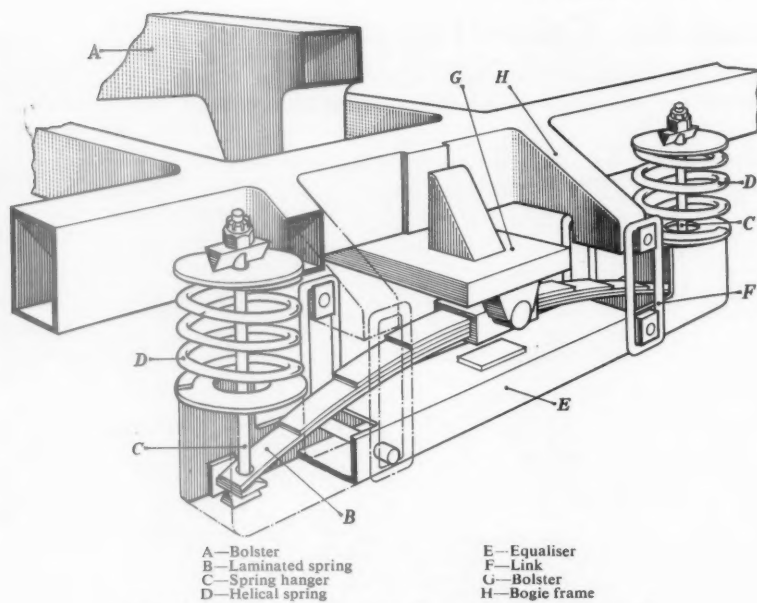
Cairo-Helwan suburban line of the Egyptian Republic Railways was electrified recently on the 1,500-V. d.c.

system with overhead current collection; and the heavy and still increasing passenger traffic is now being handled



*Elevation and plan of three-car set, showing different lengths of vehicle, and ample standing space. At peak traffic periods a total of almost 600 passengers can be carried, equal to a specific weight of about 425 lb. a passenger, and with 3 1/4 passengers per ft. of body length*





Allan bogie suspension as used on Cairo-Helwan stock

by 25 three-car multiple-unit trains.

Built by N.V. Allan & Company, of Rotterdam, and with electrical equipment built in Germany by Siemens-Schuckertwerke, each train set consists of a third class motor coach, a third class trailer, and a second class control trailer. The train is non-articulated, and as shown in the accompanying diagram, extends over a length of 186 ft. Seating capacity is 49 second class and 116 third class; but ample standing room is a feature, and a three-car set with an empty weight of 117 tonnes has a crush-load capacity of 600 or more.

Though all bogies are almost identical, the coach body framings are not the same in construction, and all have different lengths and different bogie pivot pitches. Additional to the dimensions given on the diagram, leading particulars of a three-car set are: motor coach 54 tonnes weight; trailer 30 tonnes; control trailer 31½ tonnes; top speed 62 m.p.h., limited on Helwan line to 50 m.p.h.; wheel dia. 41½ in.; total motor output 920 kW. (1,235 h.p.) on 1-hr. rating.

#### Integral Construction

The coaches are of an integral all-steel construction, and both the car bodies and the bogies are made of pressed and standard sections, entirely electrically welded. The floor is of corrugated steel plate, with the corrugations in the longitudinal direction and welded to the underframe. This flooring is covered with Induroleum. The walls are panelled with metal-faced plywood, the ceiling with plywood only. Flooring, side walls and roof are insulated with sprayed asbestos. The windows are full-drop and balanced, and the venetian shades outside are also of the full-drop type. Second class

seats have rubber cushions and are upholstered with artificial leather; in third class the seats and backs are made of wooden strips. Luggage racks are placed along the side walls above the windows. Ventilation is by means of Airvac extractors on the roof, and electric fans are placed in the passenger compartments.

To give rapid loading and unloading each coach is provided on either side with three double sliding doors which are equipped for electro-pneumatic control from the guard's position in the luggage room. The emergency brake is operated by pulling a chain running at one side behind the panelling, and is accessible above each window.

#### Bogie

The bogie frame structure is made of special sections, fully welded up. Primary suspension consists of straight

equalisers *E* underslung through links *F* from the axleboxes. Each axlebox comprises one self-aligning SKF roller bearing, following Dutch practice since 1930.

To arrange room for the magnetic railbrake, and to improve rolling stability, secondary suspension is brought outside of the frame and consists of two helical springs *D* in series with one laminated spring *B* on each side, thus sifting out high-frequency vibrations from the bogie frame *H* and damping long-wave movements without viscous dampers.

Lateral movements are frictionless, as may be seen from the accompanying sketch; and up to a certain amplitude are very soft, with a low natural frequency, so that the hunting movement of the bogie is mostly over critical. If the amplitude is increasing to such an extent that spring hanger *C* is short-circuited, the re-setting force is increased additionally so as to prevent the bolster *A* and *G* from swinging too much.

#### Traction Equipment

Electric traction equipment is placed under the floor of the motor coach, and in a high-tension cubicle against the back of the driving cab partition. The 1,500-V. d.c. current is fed via the pantograph to the nose-suspended traction motors, of which there are four, all on the motor coach. Individual 1-hr. rating is 230 kW., and individual continuous rating is 164 kW. Drive is through single-reduction gears with a ratio of 16:72, but resilient gearwheels are used in six train sets and solid gearwheels in the others. Traction motors are arranged for self-ventilation, with air-intake louvres mounted high up on the sides of the motor coach above window level.

#### Controls

By means of the master controller in the driver's cab, traction motors can be notched in three running positions: series full field; parallel full field; and parallel reduced field; and there is also



Bogie with magnetic rail brake, non-driving trailer

a series position of full field with all resistances in circuit for shunting purposes. A deadman device is incorporated.

Acceleration is entirely automatic, by means of a camshaft controller with built-in electric servo motor drive, controlled by a relay during the acceleration period. This control system is generally applied for electric train sets, and in particular for suburban traffic with a close-headway where rigid adherence to all timings is necessary. In this way any voluntary action by the driver is eliminated and a high uniformity of service is achieved. Operation of the train set is thus simplified, and the driver can pay more attention to the track and the signals. The installation is protected by an automatic circuit breaker.

Starting tractive effort, which can be maintained up to a speed of 42 km.p.h. (26 m.p.h.), is 23,500 lb., but the starting current can be decreased by the driver by means of a lever on the control panel, which has two positions: train loaded and unloaded.

#### Chrono-tachometer

A chrono-tachometer records the speed, time, and distance covered, the indications given by the signals passed, and a vigilance indication showing whether or not the driver has operated the vigilance button during a distance of 100 m. before passing a signal. Furthermore, all signal lights are repeated by buzzers and indicator lights in the cab. In the event of the driver not obeying a signal of danger, the current is automatically cut out and the brake applied. This vigilance and automatic train control was supplied by Jeumont, and the tachometer by Hasler.

#### Brakes

All trains are equipped with Knorr air brakes, and an additional electro-magnetic track brake system on the



Third class compartment, showing lighting and ventilators

trailer. Deceleration from 70 km.p.h. (43 m.p.h.), is 0.9 metres per sec. per sec. (3.05 ft. per sec. per sec.) with the air brakes, and 1.1 metres per sec. per sec. (3.6 ft. per sec. per sec.) when the track brake is also used. Compressed air is supplied by two compressors, each driven by a 1,500-V. electric motor.

#### Automatic Couplers

Two or three train sets can be coupled by automatic Scharfenberg couplers and operated in multiple-unit by one driver. Coupling of draw gear and air brake piping is automatic, but electric connections are made separately.

The 96-V. d.c. control and auxiliary current is supplied from an 8.5 kW.

motor-generator set, suspended from the underframe by resilient mountings. Lighting is by fluorescent tubes, placed in one row in the centre of the ceiling, and the 220-V. a.c. is supplied by a converter. Incandescent lamps are placed between the fluorescent tubes, and are automatically switched on in case of failure of the latter.

#### Driver's Panel

Driving equipment, signalling equipment, instruments and switches necessary for controlling the traction operations are conveniently arranged on the driver's panel. A special switch-board, with all switches to be operated by the driver for preparing the train for driving, is also located in the driving cab.

### Design and Construction in Main-Line Electrification—1

(Concluded from page 364)

are traced out by metal rods. A rising and falling bar mounted on a movable carriage alters the angular separation of the rods to follow the variations in height of the stereoscopic image. The carriage is controlled by screws and gears and the movements are transmitted to a plotting pencil working on a pantograph table. This work is subcontracted to a thoroughly equipped aero-survey contractor.

A ground survey team takes particulars of all bridges and tunnels and logs all the basic measurements and clearances relevant to electrification. These details are presented in the form of complete surveyor's notes.

All the foregoing details go to make up the necessary preparatory work required for the completion of an

accurate, up-to-date plan view of the railway layout with all the relevant features important to electrification tied into a main chainage scheme.

#### Alterations

At this stage alterations to layout, bridges and tunnels, station platforms, buildings and track circuits and so on, are often proposed by the Civil Engineer and the Signal Engineer to meet the requirements of operating the line under electrified conditions. A considerable effort is made by railway departments in settling these details in time for the necessary pre-planning of design and construction work. When the revised details are available they are added to the layout plans and a complete picture is available of the railway installation to be electrified. The design of the overhead equipment may now commence.

(To be continued)

VANCOUVER INTERNATIONAL TRADE FAIR.—In connection with the trade fair to be held in May, 1958, in Vancouver, as part of the British Columbia centenary celebrations, the Agent General for British Columbia in London points out that imports last year through British Columbia Customs ports amounted to \$529 million and among British contributions to this total were the 28,000 tons of steel rails and angle bars supplied by the United Steel Companies to the Government-owned Pacific Great Eastern Railway, and 91 miles of submarine cable built and laid by British Insulated Callender's Cables for the B.C. Electric Company. These are examples of British enterprise on the Pacific Coast where, among openings recently listed as affording opportunities for manufacturers, are railway rolling stock, and electrical apparatus and supplies. The fair will be held in the permanent buildings of the Pacific National Exhibition, Vancouver. Particulars may be obtained from the Agent General for British Columbia, 1, Regent Street, London, S.W.1.

## Passenger Train Staff Intercommunication

*Development of equipment for Southern Region electric and diesel-electric sets*

THE provision of facilities to allow communication between driver and guard of a train while in motion has engaged the attention of railway engineers for a considerable number of years. One early system was developed by William Stroudley, Locomotive & Carriage Superintendent of the L.B.S.C.R., some 80 years ago, which used battery-operated bells by means of which driver and guard could exchange code signals when slipping coaches or in an emergency; this came into quite general use on the then L.B.S.C.R. and persisted until at least the first world war.

Equipment to allow two-way oral communication was developed in 1929 and fitted to a large proportion of the electric stock of the then London Underground and subsequently to the Waterloo & City trains of the former Southern Railway under the trade name Loudaphone.

### Regular Tests

In the case of what are now Southern Region electric trains, their regular operation involves tests both of a routine and emergency nature which require the co-operation of the two members of the train crew, that is, driver and guard. To facilitate this, and to permit a closer operational association generally, the Region has decided that Loudaphone intercommunication shall be provided on its future electric and diesel-electric stock after successful running tests had been carried out. The first to be provided with these facilities are the diesel-electric multiple trains now running between London and Hastings via Tunbridge

Wells described in our May 10 issue.

It was desired to employ the "duplex" system, whereby both instruments can operate simultaneously, and after development work by engineers of the Region with the co-operation of Clifford & Snell Limited, the makers of the instruments, the equipment was evolved to meet the requirements of high volume level, good reproduction and elimination of feed back, and so on.

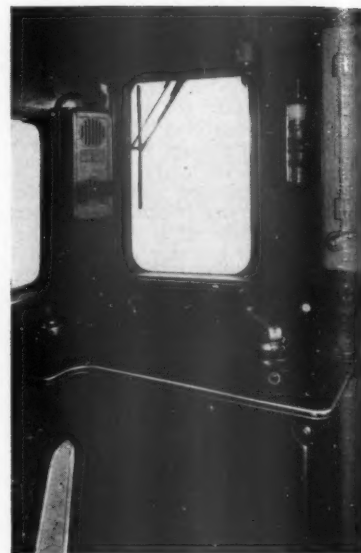
In its final form the equipment consists of a diecast box with a hinged cover on the inside of which most of the components are fitted. The instrument is mounted at the left side of the driving window of each driver's cab as shown in the illustration. An extension bell is fitted in each guard's compartment operating in parallel with the buzzer.

Loudaphones are energised from the control supply but in the event of a line failure, the control voltage is automatically derived from the emergency battery and the equipment is designed to work at the lower discharge voltage of the battery.

### Operation

The equipment is operated in a similar manner to that of a simple self-contained telephone system. Attention is called by pressing the call button which energises the buzzer in the remote instrument and the bell in the guard's compartment, acknowledgment being made in the same way. Both speak buttons are then pressed and conversation is established.

The communicating door between motorman's cab and guard's compart-



*Loudaphone equipment mounted in driving compartment*

ment enables the guard, on receiving a call bell signal from the motorman, to use the speaking instrument in the adjacent cab.

The equipment is being manufactured by Clifford & Snell Limited of Sutton, Surrey, to the specification drawn up by the Chief Mechanical & Electrical Engineer, Southern Region, Mr. W. J. A. Sykes, to meet the requirements of the Chief Operating Superintendent of the Region, Mr. S. A. Fitch.

### New South Station in Vienna

*(Concluded from page 360)*

co-operation of Messrs. Rudolf Maculan and Kurt Walder, whose own design was considered the best of those sent in. The platform awnings have been constructed on the Maculan system, which uses a specially lightweight form of tensioned wire assembly supporting the sheet metal plating. It was essential to keep the load to a minimum over certain existing arches.

### Separating Traffic Streams

The leading idea has been to effect complete separation between incoming and outgoing traffic streams, with the shortest possible approach from the street and public transport stopping places. The plan, reached after conferences with the railway commercial, operating departments and the postal and municipal authorities, involves a

ground floor entered from the Wiedner Gürtel, where tramway routes converge, with exit to the Schweizer Garten.

On this level are the ticket windows, enquiry office, lavatories, snack bar and post office, etc., and from it stairs and two escalators lead to the circulating area of the East Station, about 13 ft. above, with main restaurant (which can be reached also directly from the street or the snack bar) and access to the platforms, 380 yd. long. Departures take place from each side and arrivals in the centre.

### Two Track Levels

From this second level again a staircase and single escalator lead up to the South Station, about 16 ft. higher, with its own circulating area. Here the departures take place only on the left and arrivals on the right.

Eventually there will be nine tracks at each rail level but the whole of the

work is not yet completed. Luggage lifts connect all three levels. Some of the old station buildings are being retained for staff purposes and the original overall roof has been removed to provide much-needed additional accommodation at the Floridsdorf locomotive works, which also was badly damaged during hostilities.

### Delays in Construction

The new building involves considerable use of steel and glass. Work on it was begun in 1951, but financial difficulties compelled its cessation from April, 1952, to November, 1953. Improvements being undertaken in connection with the re-alignment of the so-called junction line, already mentioned, will much increase the convenience offered by the new station, alongside which a building for the Post & Telegraph Department in conjunction with railway mail traffic is to be erected.



## RAILWAY NEWS SECTION

## PERSONAL

Mr. A. H. Grainger, Deputy Chairman of the London Transport Executive, has accepted the office of President of the Railway Students' Association for 1957-58.

Sir Reginald Wilson, Chairman of the Eastern Area Board of the British Transport Commission and a member of the Transport Commission, who, as recorded in our

Transport" (read to the Irish section of the Institute in Dublin in 1955), and "Structure and Purpose in Transport Organisation" (read to the Midland section of the Institute in Birmingham in 1956). In 1953 he was presented with the Triennial Award of Merit, the highest award of the Institute. He was first elected to the Council of the Institute of Transport and became Vice-President in 1956. He takes office as President on October 1, 1957.

—was in Ceylon for two months and left toward the end of August after consultations in connection with colour-light signalling.

Mr. L. H. K. Neil, Continental Traffic & Shipping Manager, Eastern Region, British Railways, will retire on October 5, 1957. He will be succeeded by Mr. S. A. Claydon, now Deputy Shipping Manager & Port Superintendent, Harwich, Eastern Region, British Railways.



*Sir Reginald Wilson*

Elected President of the Institute of Transport



*Dr. C. V. von Abo*

Re-appointed a Member of the Board, South African Railways & Harbours

March 22 issue, has been elected President of the Institute of Transport this year, is 51. Sir Reginald Wilson has spent a great deal of his time abroad but, since his return to this country on the outbreak of war, has been closely connected with the transport world. As Director of Finance at the Ministry of War Transport he was responsible for the financial aspects of wartime shipping, the railway agreements, and the operation of the inland road haulage scheme. He was adviser on special matters to the Control Commission for Germany early in 1947 and a member of the Royal Commission on the Press. He was knighted in 1951, became a member of the British Transport Commission in 1953, and Chairman of the Eastern Area Board in 1955. He is also a director of the Scottish Omnibuses group, which covers most of the bus services in Scotland. Sir Reginald Wilson is the author of several notable papers, including "The Framework of Public Transport" (read at the Glasgow Congress of the Institute in 1953); "For and Against Monopolies in

Sir George Cuffe is leaving the United Kingdom for Pakistan at the end of this month to join a committee set up by the Pakistan Government to consider certain questions affecting the future of Pakistan Railways.

Two railway experts are now in Ceylon to give railway advice. They are Mr. Lloyd J. Kiernan of the U.S.A., and Dr. Shoichi Yokobori of Japan. Mr. Kiernan has been nominated as Railway Administration Consultant through the U.S.A. Operations Mission to Ceylon. He will stay in Ceylon for approximately six months, during which he will conduct an investigation into the railway's organisation, administration, and methods. Dr. Yokobori is an officer of the Japanese National Railways. He is engaged on an examination of rolling-stock designs and specification with a view to obtaining maximum efficiency within limits imposed by track alignment, sharp gradients, etc. Another American railway consultant—Mr. Robert M. Phinney

Dr. C. V. von Abo, Ph.D., M.A., B.Sc., A.M.I.C.E., who was appointed a member of the Railways & Harbours Board in July, 1952, has been re-appointed to the Board for a further term of five years. He was a research engineer on the staff of the South African Railways when he retired in 1945.

The British Transport Commission announces the following appointments:—

*General Staff of the Commission*

Mr. G. F. Stoddart, Traffic Costing Officer, Euston, to be Traffic Costing Officer (Great Eastern Line), Liverpool Street, Finance Department, Costings Division.

*British Railways Central Staff*

Mr. E. R. Dunnett, Assistant (Freight Rates), to be Assistant Freight Officer (General), Commercial Department.

We regret to record the death on September 23 of Major Guy Talbot Lemon, O.B.E., formerly of the East Indian Railway.



*Mr. N. Richardson*

Appointed Assistant (Planning) to Commercial Officer, L.M. Region

Mr. N. Richardson, M.Inst.T., who, as recorded in our August 2 issue, has been appointed Assistant (Planning) to the Commercial Officer, London Midland Region, British Railways, began his railway career on the former L.M.S.R. in the Mineral Manager's Office at Manchester in 1926. He transferred to the London Mineral Agent's Office at St. Pancras in 1930 and, from 1936 to 1941, gained wide general experience at the District Goods Manager's Office, Broad Street, and at goods stations in the London district. In 1941 Mr. Richardson was seconded to the L.M.S. Executive Research Office at Euston, returning to the District Goods Manager's Office, Broad Street, in 1946 in charge of station working. In 1950 he became head of the joint Chief Commercial & Chief Operating Managers' Claims Prevention Section, acting as Chairman of a number of inter-regional ad hoc sub-committees on traffic lost and stolen. He was appointed Head of Section (Claims), Chief Commercial Manager's Office, in 1953. Mr. Richardson was promoted in 1955 to the position of Assistant (Productivity & Work Study—Clerical Staff), Chief Commercial Manager's Office, London Midland Region, with responsibility for office mechanisation.

Mr. G. Yorke, M.Inst.T., has been appointed Divisional Superintendent "C," in charge of the District and Piccadilly Lines; at the same time he has been made an officer of the Executive. Mr. Yorke joined the London Electric Railways as a cadet in 1920, and was appointed Experimental Assistant later the same year. He became Assistant to the Divisional Traffic Superintendent in 1926, District Traffic Superintendent in 1938, and Superintendent (Staff) in 1948. In 1952 he became Divisional Superintendent for the District and Piccadilly Lines, transferring two years later to a similar position on the Northern and Northern City Lines. During the 1914-18 war, he was commissioned in the Territorial Army in 1915 and was later appointed Commandant of a Divisional Musketry School. After service with the B.E.F. in France, he was appointed Musketry Staff Officer, Officers' Command Depot. He was demobilised in 1919 with the acting rank of Captain.



*Mr. C. Hearnshaw*

Appointed District Operating Superintendent, Hull, North Eastern Region

Mr. C. Hearnshaw, District Operating Superintendent, Gloucester (Eastgate), London Midland Region, British Railways, who, as recorded in our September 13 issue, has been appointed District Operating Superintendent, Hull, North Eastern Region, began his railway career with the former Midland Railway in 1922 as a junior clerk in the Sheffield district. After experience at various stations he was appointed a Relief Stationmaster in 1929. A period of special service as a Junior Assistant to the District Goods & Passenger Manager at Sheffield was followed by transfer in 1937 to the personal staff of the Divisional Operating Superintendent at Derby. In 1946, on the formation of the District Operating Manager's Organisation at Rotherham, he became Assistant to District Operating Manager, and, in 1950, moved to Gloucester as Assistant District Operating Superintendent. In January, 1954, he transferred temporarily to the Birmingham district as Assistant District Operating Superintendent and, in July of that year, became Assistant District Operating Superintendent, Rotherham. In September, 1956, he was appointed District Operating Superintendent, Gloucester (Eastgate), the position he now vacates.

Mr. Dick Stockings, Diesel Assistant to Motive Power Superintendent, London Midland Region, British Railways, has been appointed Diesel Assistant to Motive Power Superintendent, Eastern Region.

Mr. J. W. Christopher, Assistant District Operating Superintendent, Kings Cross, Eastern Region, British Railways, has been appointed District Operating Superintendent, Kings Cross.

Mr. George Tucker, Wine Butler of the Euston Hotel, has been installed Chairman of the Guild of Sommeliers. The Guild, which has some 1,200 members and was inaugurated five years ago, is an organisation designed to help the young wine butler in his career. Wine tasting and lectures are a regular feature and visits to Continental wine countries are arranged. Mr. Tucker, who has been Wine Butler at Euston Hotel for 12 years, was Sergeant-Caterer with the R.A.F. Bomber Command during the recent war.



*The late Mr. G. M. Thompson*

District Motive Power Superintendent, Eastleigh, Southern Region, 1954-57

We regret to record the death on September 18, at the age of 51, of Mr. G. M. Thompson, District Motive Power Superintendent, Eastleigh, Southern Region, British Railways. Mr. Thompson, whose appointment to Eastleigh took place in June, 1954, was educated at the Imperial Service College. He began his railway career with the former London & North Western Railway in 1922 as a Premium Apprentice at Crewe and, after a period in the Drawing Office, became an improver fitter at Derby (Midland Division, L.M.S.R.). He subsequently became Runner to the Divisional Motive Power Superintendent, Derby, and later, to the Superintendent of Motive Power. Later appointments were: Running Shift Foreman, Buxton; Shed Foreman, Rowsley; Running Shift Foreman, Toton (where he acted as Assistant District Motive Power Superintendent and Foreman Fitter); and Running Shed Foreman, Agecroft, Central Division, L.M.S.R. During the 1939-45 war Mr. Thompson served as a pilot in the R.A.F. with the rank of substantive Flight-Lieutenant and, on release from H.M. Forces, he returned to the railways as Assistant District Motive Power Superintendent, Chester. He subsequently became Assistant District Motive Power Superintendent, Nine Elms, Southern Region, and later took up a similar position at Woking. Mr. Thompson held a commission in 157 Locomotive Running Squadron, R.E. (A.E.R.).

The following appointments have been announced by the Southern Region of British Railways:—

Mr. F. A. Trott, Regional Ambulance Secretary, as Regional Welfare Officer with effect from October 1, 1957, succeeding Mr. J. Lithgow, who is retiring.

Mr. G. H. Luck, Staff Assistant, Shipping & Continental Manager's Department, as Assistant (Salaried Staff), Regional Establishment & Staff Office, Waterloo, with effect from September 30, 1957.

Mr. H. W. F. Rudkin, Head of Salaried & General Section, Regional Establishment & Staff Office, Waterloo, as Staff Assistant, Shipping & Continental Manager's Department, Victoria.

## Institution of Railway Signal Engineers

### Visit to signalling installation at West Ealing

The autumn technical meeting of the Institution of Railway Signal Engineers was held, by permission of Mr. K. W. C. Grand, General Manager, Western Region, at West Ealing Station on September 14, when the signalbox, brought into use on March 20, 1955 (see our issue of May 20, 1955), and much of the equipment and tools used to mechanise and improve the efficiency of signal installation and maintenance work were inspected.

The party was led by the President, Mr. A. W. Woodbridge. He was supported by Mr. J. F. H. Tyler, Senior Vice-President; Messrs. R. Dell, J. C. Kubale, and T. S. Lascelles, Past Presidents; Messrs. O. Hoffman, M. Le Sueur and W. Owen, Members of Council; Mr. G. J. Dickinson, Hon. General Secretary; Mr. B. Reynolds, Hon. Treasurer, and Mr. V. H. Smith, Hon. Secretary of the General Purposes Committee, responsible for the arrangements. It was received at the station by a number of Assistant Engineers and technical staff who acted as guides and distributed to each member a printed account of the items to be seen.

#### Signalbox

The signalbox contains a mechanical lever frame operating a number of shunt signals and points in the immediate vicinity, with an "entrance-exit" type panel controlling, with facilities for automatic through working on certain routes, all the multiple-aspect signals and remote points and shunt signals. One of the remote point layouts was inspected. Point machines are of the d.c. pole-changer type with superimposed a.c. detection, each being operated over local relays and contactors from accumulators at the site. The panel controls 52 separate routes, while the majority of the multiple-aspect signals, each of which has a rectifier fed A.T.C. ramp 200 yd. in rear, are four-aspect. There are 82 a.c. capacitor fed track circuits and also one of the d.c. pulsed type.

#### Train Describers

There is also a very complete installation of train describers, combined with "train approaching" and audible warnings, and the centralisation achieved by the scheme, which enabled four signalboxes to be dispensed with, is its leading operational feature. For the greater part of the time automatic through working is in force, particularly on the main lines, and together with the improved train regulation resulting from the bringing of an appreciable area under one point of control has greatly improved the operation of this important main route.

#### Inspection of Mechanical Equipment

The various items of mechanical equipment were shown in actual work nearby and the various operations to be effected by them clearly demonstrated. They consisted of a rail mounted earth auger machine, for boring holes and erecting telegraph poles or signal posts therein; an aerial cable winch and drum carrier for the erection of multi-core aerial cable with self-contained catenary wire; a machine for rapid excavation of cable trenches; a portable 3-kW. auto-diesel generating set for supplying electric tools and floodlights; a 600-W. portable generating set for the same purpose; an electric rail-

bonding drilling machine; a self-contained petrol actuated road breaker for breaking up concrete, hard ground or consolidated ballast; a portable pump for draining trenches, sumps, etc., of 50-100 gal. per min. capacity; a set of floodlights on telescopic stands; a concrete mixer for use in confined spaces; a trolley-carried oxy-acetylene cutting and welding set, with a number of electric tools—combined morticer, several drills, saw, planer, grinder and rapid blow hammer—and a personnel and equipment vehicle constructed to convey 11 men and driver and a substantial quantity of materials, under maximum conditions of comfort. The variety and capacity of these appliances were much admired.

Luncheon was then taken at the Park Hotel, Hanwell. Mr. A. W. Woodbridge presided and offered the Loyal Toast.

Mr. R. Dell, Past President, proposed a vote of thanks to Mr. K. W. C. Grand and the Western Region for the excellent facilities granted to the Institution, also to Mr. Woodbridge and the many members of his staff who had done so much to organise the visit from their side and make it so valuable.

#### Mechanisation

The President, Mr. Dell stated, was to be congratulated on having applied mechanisation to signal engineering construction and maintenance work. Undoubtedly it was the right thing; with the prevalent shortage of suitable labour it had become essential to find more rapid and efficient ways of carrying out their tasks. Most of what they did as signal engineers was aimed at effecting economies for the traffic department but they should seek every means of bringing like advantages to themselves. The signalling installation they had been allowed to see was another example of the trend towards greater centralisation of controls, which

certainly would find increased application generally and offered great possibilities in improved traffic operation.

Mr. A. W. Woodbridge, in reply, stressed the conditions under which the scheme for the work at West Ealing and on the approach lines had had to be designed, calling for much careful thought and planning to get maximum value from the available resources. He had not, unfortunately, been able to show them a modern complete power installation but they had such in progress now elsewhere. The application of mechanisation and work study methods was bringing excellent results, but there was plenty of scope for further progress in those fields and especially in the designing of tools adapted to particular jobs or circumstances. If any of them could produce such they could be sure of an appreciative user in himself.

Mr. J. C. Kubale, Past President, proposed a vote of thanks to Mr. V. H. Smith and the General Purposes Committee for the excellent manner in which the visit had been organised.

## Staff and Labour Matters

### Railway Wage Claim

A meeting took place on September 20 between representatives of the B.T.C. and of the T.S.S.A. to consider the position arising from the last settlement on salaried staff rates of pay. In reply to a statement made by the T.S.S.A. as to the reason for seeking a review at this time, the Commission representatives intimated that it was not possible to proceed on the basis of periodical reviews without agreement by all parties to the machinery of negotiation. The representatives of the T.S.S.A. said that they would report the result of the discussion to their executive.

As previously reported, the N.U.R. has submitted a claim for a substantial increase in the rates of pay of railway salaried and conciliation staff but, at the time of going to press, no meeting had been arranged in connection with this.

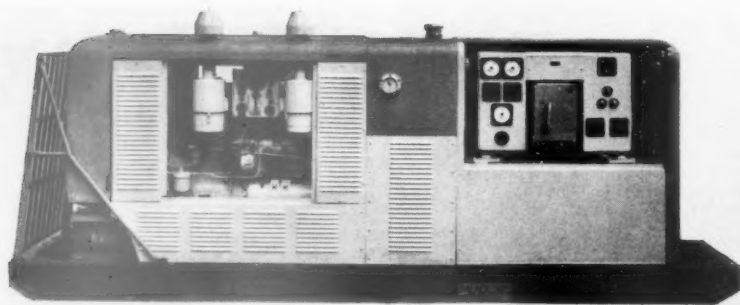
## Opening of Darlington Diesel Maintenance Depot



(Left to right, on platform): Sir Fergus Graham, Mr. G. R. H. Nugent, Mr. T. H. Summerson, and Mr. H. A. Short (see article on page 358, also account of opening in last week's issue)



## NEW EQUIPMENT AND PROCESSES



### Rationalised Power Plants

A RANGE of generating set and power pack equipment, introducing a planned scheme of standard parts and interchangeability, is announced. These sets, which apart from the normal civil engineering or industrial applications, can form the basis of a self-contained power car on a passenger train, are reduced to three basic frame sizes, from which by using standard variants, almost any requirement can be met.

The aim of the rationalisation is the speedy assembly to a precise specification of a wide variety of units, the reduction in time being reflected, it is claimed, not only in the low first cost but also in the cost of installation, servicing and maintenance.

The complete range is based on the manufacturer's six standard power units with outputs of 22 to 161 kW, in the generating set range and 36 to 270 b.h.p. in the power pack range. The 63-kW generating set is illustrated. The larger sets are considered to be about the maximum size which can be readily transported as complete sets, either in the skid base or

trailer mounted form. Furthermore, it is stated, in view of the high power-weight ratio, the floor loading and absence of vibration is such that prepared foundations are not necessarily required and the sets can even be installed on the upper floors of completed buildings.

Standard variants include the following groups of components; air cleaner, bed-plate, cooling system, canopy, engine control instruments, engine protection devices, exhaust, fuel and lubrication systems, automatic control, power take-off arrangements, starting systems, switchboard instruments, throttle control, trailer mounting and treatment specifications.

Details may be obtained from the manufacturer, Henry Meadows Limited, Electrical Equipment Division, Fallings Park, Wolverhampton.

### Small Fixed Crane

A SMALL stationary fixed crane, the Saga Junior, is of application to civil engineering building operations, small stores and factories, and so on.

Developed from the manufacturer's patented winch and scaffold jib, the crane

is powered by a Villiers air-cooled 2½ h.p. petrol engine and can lift up to 6 cwt. A lift height of some 100 ft. is within the machine's capacity.

A feature of the winch is the provision of three separate hoisting speeds in the transmission, enabling lighter loads to be raised at proportionately higher speeds. All winch bearings are totally enclosed ball bearing journals and require no lubrication; subsidiary bearings are of the bronze self-lubricating type.

Leading particulars of the crane are: hoist speeds for 6, 5 and 4 cwt. loads are 40, 55 and 85 ft. per min.; radius, 5 ft. 10 in. Twin-shoe brakes with independent eccentric adjustment are fitted with an area of some 12 sq. in. of anti-friction linings. The rope drum is of aluminium alloy capable of holding 400 ft. of steel wire rope. The winch frame is of steel construction with a lock-alignment feature for pinion and drum shafts, and the base is fabricated from mild steel plate. Enclosed vee-belt drive is used for transmission purposes.

Control is by a single hand lever with an automatic return to the brake position. Slewing is through 360 deg. and is accomplished by hand.

The winch consists of four parts only and two men can easily dismantle the whole unit when required.

The Saga Junior fixed crane is manufactured by the British Hoist & Crane Co. Ltd., of Compton, Berkshire, from which full details may be obtained.

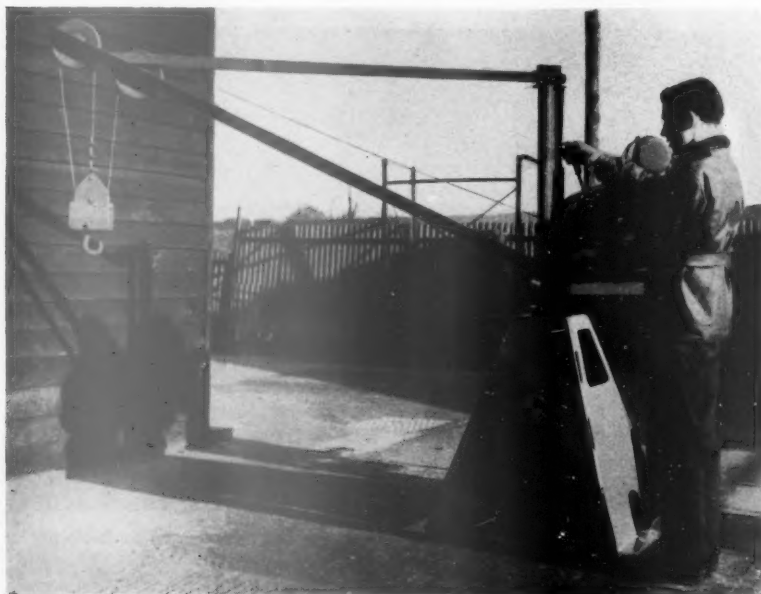
### Metal Primer and Conditioner

THE Supra etch primer and metal conditioner has been produced to provide much greater anti-corrosive properties than the usual type of etch primer and is of application where all types of metal are used in the production of, for example, rolling stock.

This material is stated to possess two distinct advantages over conventional types of primer. As a metal pre-treatment or conditioner it acts as an adhesive bond for subsequent paint films without elaborate chemical preparatory work other than simple solvent degreasing, and it also provides an anti-corrosive film of approximately 0.1 to 0.3 mils. with very high corrosion resistance, etching itself to the surface of the metal.

When used on aluminium and its alloys, pre-treatments such as anodising and pickling are unnecessary. It is also recommended for adhesion to a wide variety of other metal surfaces including steel, zinc, cadmium, tin, copper, lead, magnesium, and galvanised iron. All surfaces to be treated should be previously degreased and free from dust and dirt.

Supra etch primer is supplied as a two-part system: first as a pigmented base paint, and second an accelerator thinner. After mixing, the resultant paint is suitable for brush application or for spraying at a pressure of approximately 40 lb. per sq. in. The material may be stove dried when used in conjunction with stoving finishes, at a temperature of 250 deg. F. for 30 min. When air-dried the film is touch-dry in 15 min. although it is necessary to allow 60 min. to elapse before applying subsequent paint films. The flash point of both base and curing



thinners are below 73 deg. F. By the use of this metal conditioner, it is now possible it is claimed to apply a coating that is at least equivalent to shop-applied pre-treatments to metal.

Further details are obtainable from Supra Chemicals & Paints Limited, Supra Works, Hainge Road, Tividale, Tipton, Staffs.

## General Purpose Welding Electrode

A MANUAL welding electrode for mild steel, has been developed, which combines the good welding properties of the B.S.1719 Class "2" electrodes with the good mechanical properties and sound weld metal of the low hydrogen Class "6" electrodes.

With the trade name Ferromax, this electrode is stated to represent a different approach to the problem of hydrogen in weld metals. It has a rutile type of covering and yet deposits a weld metal which is very low in hydrogen content. This results in a better fillet weld shape compared with the standard low hydrogen electrodes as well as a considerable reduction in fumes.

In addition, iron powder has been introduced into the covering, allowing faster welding speeds than can be obtained with either conventional rutile or low hydrogen electrodes and at least equal to those of conventional iron powder rutile electrodes.

A feature of Ferromax heavily-coated iron-powder rutile electrodes is that they can be used in all positions for producing welds of high radiographic quality. They give welds of good shape and contour and are particularly suitable for "V" and "U" grooves in flat butt welding.

The electrodes have the code no. E.917 under B.S.1719 Classification and conform to B.S.639, and are approved by Lloyd's Register of Shipping and Ministry of Transport and Civil Aviation.

Further details of Ferromax electrodes can be obtained from the manufacturer, Quasi-Arc Limited, Bilston, Staffs.

## Versatile Hydraulic Equipment

THE Flexi-Force range of portable hydraulic equipment, with capacities of from 2 to 100 tons, has applications to many aspects of railway engineering in workshops and maintenance depots.

Applications for which the equipment has been used in railway workshops include the removal of locomotive big end bolts, carriage bogie spring adjustment, rolling stock and wagon solebar and chassis straightening, withdrawal of diesel locomotive driving cranks, and the fitting of locomotive driving rod bushes.

The equipment is operated from hand pumps of varying sizes, and complete kits are available of general maintenance tools for toe lifting, pipe bending and so on. Safety of operation is claimed for this equipment as the operator can be a distance away from the lifting action.

Various types of auxiliary equipment are available. These include manifolds which are available in three standard sizes, that is two-way, three-way and four-way, to enable multiples of rams to be operated at one time. They can be supplied either with or without control valves and can either be permanently connected directly to the pump or added when required to the normal pump hose. In the latter case the manifold needs a female half-coupling.

The illustration shows a 50-ton ram and

special adaptor drawing a driving crank from a diesel locomotive axle, which was formerly, it is stated, a formidable operation normally leading to the scrapping of the item concerned.

Full details of the range of equipment may be obtained from the manufacturer, Epco Limited, Star Works, Leeds, 7.

## Portable Tamping Machine

THE Robel 2 tamping machine, powered by an air-cooled petrol engine, which is claimed to be almost recoil-free, is now available in this country. This tamper working on the hammering principle, as opposed to a vibrating system, incorporates a pair of reciprocating cams, and is designed to give 2,800 impacts per min.

For tamping rail ballast under sleepers, for tearing up old track beds and similar work, the low weight of the machine allows it to be easily handled, and its simple construction results, it is stated, in low operating costs. Quickly interchangeable tools and accessories are provided.

The 50-cc. two-stroke engine is flanged directly to the gear case. Reduction gear wheels, running in an oil bath, transmit the power to the eccentric shaft which operates the connecting rods imparting a reciprocating movement to the cross-heads. Two guiding rods are mounted in bearings on each cross-head, which bear on rams which, when set in motion, are thrust alternately on to the depressed tool. If the toolholder is not depressed, the reciprocating rams swing freely to and fro and owing to the uniformity of the drive and running prevent any recoil.

The toolholder has a conical bore for the admission of the interchangeable tools. The inserted tool is drawn in by a flat key which is secured by a conical spring; the tool can be changed easily.

Approximate leading dimensions of the tools are: Length, 51½ in.; width, 13½ in.; height, 16½ in. The weight of the machine with an average tool and support is some 75 lb.

Full details of the tamping machine, which can alternatively be supplied with an electric motor, can be obtained from the



sole distributor in this country, Feska Industrial Equipments Limited, 27, Percy Street, London, W.1.

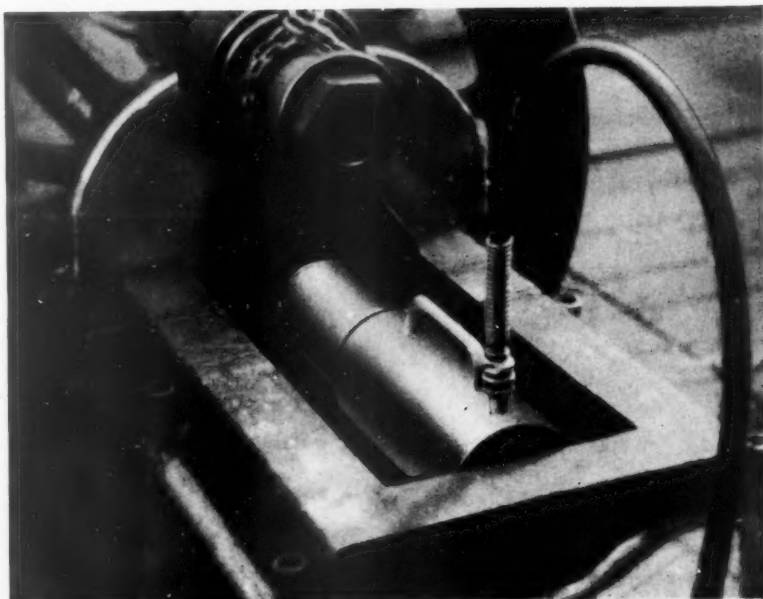
## Stainless Steel Tubing

TO meet the current demands, the manufacturer has commenced production of stainless material in welded tube form. The first runs will be made in Metior 1 (18/8) quality. It is suitable for structural and decorative purposes.

A further development is the supply of drawn welded tubing which is achieved by certain operations after the welded tubes have been produced from strip; thus intermediate sizes of tubing can be made.

The maximum size for welded tubes will be 1½ in. o.d. at present, and thicknesses between 18 and 14 g.

The manufacturer is Talbot Stead Tube Co. Ltd., Green Lane, Wallall, Staffs.



## Open Day at Superheater Co. Ltd. Works

The Chairman of the Superheater Co. Ltd., Sir Alexander L. McColl, Messrs. H. Melhuish and L. C. Southcott, Assistant Managing Directors, and other Directors of the firm, received guests on the Open Day and inspection of the new offices and works at Trafford Park, Manchester, on September 25.

The guests were representative of many aspects of the engineering industries, including locomotive, electrical, and marine engineering, engineering consultants, inspecting authorities, British Railways, railway undertakings overseas, the Pullman Car Co. Ltd., the Central Electricity Authority, and neighbouring undertakings at Trafford Park.

The Superheater Co. Ltd. was founded in 1910 and had its first association with Manchester in 1914 when it erected two shops and offices which now forms part of what is called the Old Works. At that time the works covered an area of one acre; today it has increased to 16 acres, 10 acres of which are covered. Offices and canteens are housed in a concrete and brick building 327 ft. x 40 ft. The company owns ground adjoining the new offices sufficient in area to erect further bays similar in size to the two new bays.

Railway sidings lead to all parts of the works. Overhead cranes are provided in all bays. At present there are 15 production bays served by a total of 21 overhead cranes with capacities of 3-10 tons. Two mobile cranes with capacities of 5 and 4 tons respectively are also available.

### New Bays

The two new bays are each 420 ft. long and 80 ft. wide. They are equipped with crane gantry to withstand a 20-ton lift. At present each bay is equipped with one 10-ton and one 5-ton overhead travelling crane.

The architects for the new works and offices were Harry S. Fairhurst & Son, of Brown Street, Manchester, 2; and the main contractors were A. Monk & Co.

Ltd., of Padgate, Warrington, Lancs. General administration, design, and sales and service are carried out at the head office at 53, Haymarket, London, S.W.1. The Locomotive and Marine Divisions are situated in Haymarket House.

The Superheater Co. Ltd., and its subsidiaries in Great Britain have, on an average, 670 employees of whom some 140 are based in London. The welfare of employees has for many years been promoted by the management.

Basically the main products are the design, manufacture and servicing of steam superheaters, reheaters, desuperheaters, and so on, for use with or in conjunction with all classes of steam boilers fitted in locomotives, ships, electricity supply stations, and industrial plants. All classes of heat exchangers also are supplied for process work for the oil industry, gas turbines, etc. In addition steam dryers and steam purity test apparatus are supplied by the company and through its subsidiaries, independently fired superheaters, thermometers and other temperature-recording instruments.

Export work is currently 52 per cent of all production, exports are sent to over 40 countries.

## Construction of Stratford Diesel Maintenance Depot

Construction is progressing of a maintenance depot for diesel multiple-unit trains and locomotives at Stratford, Eastern Region. It is anticipated that it will be brought into use later this year.

Designed for the maintenance of diesel trains and shunting locomotives the depot will also be used for a period for the servicing of some of the main-line diesel locomotives which will be allocated to the Eastern Region.

There will be a steel-framed structure covered by asbestos sheets, and dwarf brick walls, natural lighting being provided by vertical glazing in the walls and roof lights. In accordance with modern practice the rails within the depot will

be carried on piers and beams; this feature, together with low level working areas between the tracks and working platforms at footplate height, to suit diesel locomotives, will give ease of access for staff to the underfloor engines and transmissions of diesel railcars, and equipment above the footplate on diesel locomotives.

Equipment in the depot will include a hoist and runway, compressed air plant, fuelling and battery charging installations in addition to an injector testing room and offices and stores. Electric lighting and plug points will be fitted throughout and space heating will be by panel heaters fed from an oil-fired boiler.

## New T.E.E. Services

The latest Trans-Europe-Express service, between Paris, Liège, Cologne and Dortmund, announced to begin operation on September 29, bears the name "Parsifal"—evidence of good Franco-German relations, as the diesel train set working it is provided by the S.N.C.F. It leaves Paris at 7.33 a.m., covers the 141.9 miles from Paris to Maubeuge non-stop in 115 min. (74 m.p.h.), and calls thereafter at Charleroi, Namur, Liège, Verviers, Aachen, Cologne, Dusseldorf, Duisburg, Essen and Bochum, reaching Cologne at 12.38 p.m. and Dortmund at 2.16 p.m. In the reverse direction departure is at 4.43 p.m. from Dortmund and at 6.21 p.m. from Cologne, and with the same stops and a 2-hr. non-stop run from Maubeuge, Paris is reached at 11.36 p.m.

The new train thus forms the complement of the "Paris-Ruhr," which leaves Dortmund at 5.29 a.m., arrives in Paris at 12.30 p.m., returns at 5.42 p.m., and is back in Dortmund at 12.31 a.m.

The "Parsifal" gives the Paris business man 5½ hr. in Cologne, and the "Paris-Ruhr" the Cologne business man 5½ hr. in Paris, without the necessity for staying away overnight. In 1939 the fastest journey times from Paris to Cologne were 5 hr. 27 min. and 5 hr. 31 min., even with non-stop running over the 227 miles between Paris and Liège, the new T.E.E. trains have reduced these times to 5 hr. 5 min. and 5 hr. 10 min.

A further T.E.E. services, the "Mediolanum," will run between Milan and Munich, via Verona, Bolzano, the Brenner, and Innsbruck, from October 15. Departure from Milan will be at 6 a.m., and Munich will be reached at 1.24 p.m. The return journey will be begun at 3.45 p.m., with arrival in Milan at 11.5 p.m. The set for this service is to be provided by the Italian State Railways. Catering both in this train and the "Parsifal" is by the Wagons-Lits Company.

## B.T.C. (Harbours) Charges Scheme

The British Transport Commission announces that the Harbours Charges Scheme, lodged with the Transport Tribunal in July, 1956, and which has been the subject of discussion with representatives of the users of the harbours, is to be dropped, and that a new draft scheme of an interim character has been prepared after consultation with the principal national organisations of ship-owners, importers and exporters.

Like its predecessor, the new draft scheme covers dues on ships, merchandise,



View of interior of diesel maintenance depot at Stratford, Eastern Region, showing construction of low-level working area



and passengers, and charges for services and facilities specified in the scheme. It distinguishes between scheduled harbours, which include the more important dock undertakings of the Commission, and non-scheduled harbours which are mainly smaller docks.

#### Maximum Charges

In the case of scheduled harbours, maximum charges are proposed for dues on ships, merchandise, and passengers, with reasonable charges for all other specified services and facilities. In the case of non-scheduled harbours, provision is made for reasonable charges for all services and facilities. Reasonable charges would be subject to the jurisdiction of the Transport Tribunal, on appeal.

The difference between the earlier draft scheme and the present one is that whereas the former proposed uniform maximum dues for all the more important harbours according to defined classes of ships and named commodities, the new draft scheme provides for a headroom of 25 per cent above the charges now in operation at individual harbours.

#### Actual Charges

As in the earlier scheme, actual charges within duly authorised maximum charges at scheduled harbours would be at the Commission discretion.

Copies of the draft scheme which has been lodged with the Tribunal may be obtained from the British Transport Commission (Room 360), 222, Marylebone Road, London, N.W.1, or from the Chief Commercial Manager, 87, Union Street, Glasgow. Price 1s.

### British Electrical Conference at Brussels Exhibition

Under the patronage of the Belgian Commissariat-Général of the 1958 Brussels Universal & International Exhibition (April 17-October 19), a conference will be held in Brussels on May 16 and 17 of representatives nominated by the associations and firms supporting the exhibit of the British electric and allied industry; invitations have also been sent to a number of scientific and professional bodies.

The associations concerned are: the British Electrical & Allied Manufacturers' Association Incorporated; the British Radio Equipment Manufacturers' Association; the Cable Makers' Association; the Electric Light Fittings Association; the Radio Communication & Electronic Engineering Association; the Telecommunication Engineering & Manufacturing Association; and the Water-Tube Boilermakers' Association.

The President of the conference is Sir Vincent de Ferranti, and the Vice-Presidents: Sir Lawrence Bragg, Viscount Chandos, Mr. G. Darnley Smith, Sir Thomas Eades, Sir Claude Gibb, Sir Kenneth Hague, Sir Harold Hartley, Sir Christopher Hinton, Mr. J. O. Knowles, Mr. W. Messer, Lord Mills, Sir George Nelson, Sir Harry Railing, Mr. R. W. C. Reeves, and Mr. J. B. Woodeson.

The Chairman of the Organising Committee is Mr. D. Maxwell Buist, and the Organising Secretary Mr. Sam Black.

The first meeting will be held in the Exhibition Auditorium on May 16, when Sir Gordon Radley, Director General of the (British) Post Office, will read a paper: "Communication between Nations and Peoples."

In the afternoon of May 17 Sir John Cockcroft, Director of the Atomic Energy Research Establishment at Harwell, will read a paper: "Nuclear Energy, the Power of the Future." A reception will be held later in the afternoon in the Exhibition Palais d'Elégance.

Registration fees are 5 guineas for members and 3 guineas for ladies accompanying them. Members of the conference will have admission to the exhibition for the duration of the conference.

Further particulars may be obtained from the Organising Secretary, Mr. Sam Black, 36, Kingsway, London, W.C.2 (telephone Holborn 0502).

**RAILWAY BENEVOLENT INSTITUTION.**—At a meeting on September 17 the board of the Railway Benevolent Institution granted annuities to 10 widows and four members and an allowance to a child, involving an additional liability of £272 per annum. Also 149 gratuities were granted, amounting to £1,463, to meet cases of immediate necessity. Grants made from the Casualty Fund during July and August amounted to £2,091.

**NEW WATERWAYS CRAFT FOR TRENT FLEET.**—The first of two new 200-ton all-welded powered carrying craft for the Trent fleet of British Transport Waterways was launched on September 19 by the builders, Richard Dunston Limited, at Thorne, near Doncaster. They have been designed so that they can also be used, if necessary, on the Aire & Calder Navigation. They are powered by Ruston 6 YEM diesel engines of 84 b.h.p.

### Electric Traction in New Zealand



Christchurch train leaving Lyttelton, hauled by English Electric Bo-Bo locomotive; the seven-mile line is electrified to 1,500 V. d.c.

## Contracts and Tenders

### *Bogie goods wagons for Rhodesia: diesel and electric locomotives required for India*

Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from Rhodesia Railways for 200 bogie covered goods wagons, 50 with cast steel bogies, and 150 with pressed steel bogies.

Linke-Hofmann-Busch Werke has received from the Iranian State Railways an order for 100 bogie passenger coaches of a design based on that of the German Federal Railway 86-ft. standard type. This is additional to the order for 50 coaches and the bogies for 100 further coaches received some months ago from the same customer. Short delivery is a feature of the new order, and the first vehicles are expected to be shipped early in November.

The Eastern Region of British Railways announces that the following contracts have been placed:

Henry Lees & Co. Ltd., Motherwell: repairs to coaling plant at Norwich  
Cleveland Bridge & Engineering Co. Ltd., Darlington: reconstruction of superstructure of underline bridges Nos. 1942, 1945, and 1947, between Bruce Grove and White Hart Lane stations, and reconstruction of superstructure of underline bridge No. 1950 between White Hart Lane and Seven Sisters Stations

James Kilpatrick & Son Ltd., London, S.W.1: supply, delivery, and erection of electrical installation in engine repair shop at diesel maintenance depot, Stratford

W. & C. French Limited, Buckhurst Hill: reconstruction of superstructure of overbridge No. 18 between Liverpool Street and Bethnal Green Stations, and reconstruction of superstructure of overbridge Nos. 1936, 1964, and 1965 between Seven Sisters and Bush Hill Park Stations.

British Railways, London Midland Region, have placed the following contracts:

John Gill Contractors Limited, London, S.W.1: renewal of piling of bridge over Leeds & Liverpool canal between Wigan and Bryn

Salopian Engineers Limited, Prees, Shropshire: improved accommodation for stores, Derby Locomotive Works

Metal Sections Limited, Oldbury, Birmingham: establishment of a flash butt welding depot at the Central Materials Depot, Castleton

Mechanised Contractors (London) Limited, Ealing, W.5: deep reballasting and drainage of line between Finmere and Calvert

Kyle Stewart (Contractors) Limited, London, N.W.6: provision of temporary accommodation for G.P.O. staff during improvements at Euston Station

Leonard Fairclough Limited, Adlington, Lancs: work in connection with the modernisation of Reddish Electric Locomotive Depot

Hodgins Limited, Building Contractors, Fairview, Dublin: renewal of roof covering, Customs Transit Shed, North Wall, Dublin

The Butterley Co. Ltd., Butterley, Nr. Derby: reconstruction of Bridge No. 30 Friezland and Uppermill Stalybridge and Saddleworth line

British Railways, North Eastern Region, have placed the following contracts:

W. Richardson & Co. Ltd., Darlington: heating and hot water services, Boiler House Plant, Thornaby Motive Power Depot

Brightside Heating & Engineering Co. Ltd., Newcastle: heating and hot water services, Administration Block, Thornaby Motive Power Depot

H. Morfitt & Sons Ltd., Leeds: heating and hot water services, Main Stores Block, and so on, Thornaby Motive Power Depot

Paterson Hughes Eng. Co. Ltd., London: stores hoisting facilities, Thornaby Motive Power Depot.

British Railways, Scottish Region, have placed the following contracts:

A. A. Stuart & Sons (Glasgow) Ltd., Glasgow: Staff accommodation, Rutherglen

Geo. Wimpey & Co. Ltd., Edinburgh: Subway under Forth & Clyde Canal, Westerton

Industrial Engineering Limited, Glasgow: cleaning and repairing roof, St. Enoch Station, and re-roofing engine shed, Forfar

William Pyle & Company, Baillieston, Glasgow: mechanical ventilation scheme, Glasgow

Richard Crittall & Co. Ltd., Glasgow: heating installation, Glasgow

Webster Bannerman & Co. Ltd., Glasgow: repairs to engine pits and laying concrete roadways at motive power depot, Motherwell

H. M. Murray & Co. Ltd., Glasgow: maintenance and repairs, Oban pier

Automatic Telephone & Electric Co. Ltd., Liverpool: telephone equipment, Perth District Control Office

William Briggs & Sons Ltd., Dundee: repairs to roadways, Dundee West Station.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for locomotives, boilers, and generating sets as follows:—

(a) 106 diesel hydraulic shunting locomotives, 625 h.p. broad gauge (5 ft. 6 in.) Alternately

106 diesel hydraulic shunting locomotives, 400 h.p. broad gauge (5 ft. 6 in.)

(b) 7 electric locomotives, broad gauge (5 ft. 6 in.), suitable for operation from an overhead supply of 1,500 V. d.c. for Central Railway

(c) 6 boilers, type PIS, metre gauge (3 ft. 3½ in.)

(d) 4 boilers, class ZE, narrow gauge (2 ft. 6 in.)

(e) 98 diesel engine driven d.c. generating set, for installation in brakevan of passenger train for feeding electrical load of the train.

The issuing authority is the Indian Railways. The tender No. is Global Procurement Programme No. G.P.12/57/58. The address to which bids should be sent is the Director, Railway Stores, Railway Board, State Entry Road, New Delhi. The closing dates are (a), (c), and (d), November 23, 1957. (b) and (e), December 14, 1957. A copy of the tender documents, but not specifications or drawings, is available for loan to United Kingdom firms on application to Branch (Lacon House, Theobalds

Road, W.C.1.). A photo-copy set can be purchased from the Branch for 8s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify the Branch in advance of their requirements. The reference ESB/30199/56 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from Formosa for diesel electric locomotives as follows:—

10 diesel electric locomotives, general purpose design for passenger, freight or shunting, 3-ft. 6-in. gauge.

The Issuing Authority and address to which bids should be sent is the Central Trust of China, Purchasing Department, 68, Yen Ping Nan Road, Taipei, Taiwan (Formosa). The tender No. is 84-33-427-9-70389. This purchase will be financed by the International Co-operation Administration (I.C.A.). The closing date is October 17, 1957. United Kingdom firms who wish to tender should if possible obtain the necessary documents direct from the Central Trust of China. A copy of the specifications and conditions of tendering is available for inspection in Room 735, at the Branch (Lacon House, Theobalds Road, W.C.1.). An additional copy is available for loan on application. Photo-copy sets of the documents can be obtained at the cost of 12s. from the Branch. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Bids must not be submitted on these photo-copies. Firms wishing to collect photo-documents are advised to notify the Branch in advance of their requirements. The reference ESB/22747/57/I.C.A. should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, reports a call from Pakistan for components for the fabrication of 700 broad gauge wagons, including tees, angles, steel plates, black plain sheets, electrodes, cylinders, release valves, springs, axles, tyres and vacuum pipes.

The Issuing Authority is the Ministry of Communications and the tender is No. PRS-57/WAG/9/TDR. Bids should be sent to the Director General (Railways), Railway Division, Ministry of Communication, Government of Pakistan, Karachi. The closing date is November 12, 1957.

A copy of the tender documents is available for loan to United Kingdom firms in order of receipt of applications by the Branch (Lacon House, Theobalds Road, W.C.1.). A photo-copy set can be purchased from the Branch for 16s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. The reference ESB/22587/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from Formosa for the furnishing of signal equipment, engineering design, and technical assistance for installing and servicing for one year, of a centralised traffic control system between Changhua and Tainan.

The Issuing Authority and address to

which bids should be sent to the Central Trust of China, Purchasing Department, 68, Yen Ping Nan Road, Taipei, Taiwan (Formosa). The tender No. is 84-33-427-9-70388. This purchase will be financed by the International Co-operation Administration (I.C.A.). The closing date is November 4, 1957. United Kingdom firms who wish to tender should if possible obtain the necessary documents direct from the Central Trust of China. A copy of the specifications and conditions of tendering is available for inspection in Room 735 at the Branch (Lacon House, Theobalds Road, W.C.1). An additional copy is available for loan on application. Photocopy sets of the documents can be obtained at the cost of 22s. from the Branch. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Bids must not be submitted on these photo-copies. Firms wishing to collect photo-copies of documents are advised to notify the Branch in advance of their requirements. The reference ESB/22749/I.C.A. should be quoted in any correspondence with the Branch.

The Director General of the India Store Department, Government Building, Broomfield Avenue, W.3, invites tenders for the supply of main bar frames. See Official Notices on page 380.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for steel flue tubes as follows:—

114 flue tubes, steel,  $5\frac{1}{2}$  in. outside diameter  $\times$  8 SWG  $\times$  16 ft. 9 in. long, solid cold drawn, to ex-E.I.Rly., drg. No. BL-240, alt. 2 (I.S.D. No. 7892/2) to I.R.S. specn. No. R-23/51 (class and PL No. EA1/BL-240)

1,011 flue tubes, steel,  $5\frac{1}{2}$  in. outside diameter  $\times$  8 SWG  $\times$  14 ft. 2 $\frac{1}{2}$  in. long for PS, PC, PCI, PCII, APC, solid drawn to ex-E.I.Rly., drg. No. BL-241 alt. 3 (I.S.D. No. 5513/2) to I.R.S.S. No. R-23/51. (class and RL. No. EA1/BL-241)

583 flue tubes, steel,  $5\frac{1}{2}$  in. outside diameter  $\times$  8 SWG  $\times$  18 ft. 9 $\frac{1}{4}$  in. long for WP, WP/P, WG, solid drawn to ex-E.I.Rly., drg. No. BL-242, alt. 4 (I.S.D. No. 5514/4) to I.R.S.S. No. R-23/51. (class EA1/BL-242).

The issuing authority is the Director General of Supplies and Disposals. The tender No. is P/SW2/18110-H/IV. Bids should be sent to the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is October 11, 1957. A set of tender documents, including drawings, but not specifications is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1). The reference ESB/23021/57 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for level crossing gates and locks as follows:—

30 level crossing gates, lifting barrier, tubular boom type, 12 ft. gate interlocked and non-interlocked, complete with all parts as shown on the drg. to CSO drawing No. CSO/C. 1436 A & B on (CSO/C-1433A-36B) alt. 1, and to I.R.S. specification No. S-10-56 and as specified on part drawing

10 level crossing gates, lifting barrier, tubular boom type, 18 ft. gate interlocked and non-interlocked, complete with all parts as shown on the drg. to CSO drg.

No. CSO/C. 1435 A & B on (CSO/C-1433A-36B) alt. 1 and to I.R.S. specification No. S-10-56 and as specified on part drawing

40 winch gears for lifting barrier gates, complete with all parts as shown on the drg. to CSO's drg. No. CSO/C.1571 alt. nil and to specn. S-10-56 and as shown on part drawing.

The issuing authority is the Director General of Supplies and Disposals. The tender No. is WP2/4286/28/D/Level Crossing Gates. Bids should be sent to the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is October 16, 1957. A set of tender documents, but not drawings or specification, is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1). A photo-copy set can be purchased from the Branch for 13s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photocopy sets of tender documents are advised to notify the Branch in advance of their requirements. The reference ESB/23008/57 should be quoted in any correspondence with the Branch.

## Notes and News

**Gloucester Railway Carriage & Wagon Co. Ltd. Final Dividend.**—The Gloucester Railway Carriage & Wagon Co. Ltd., by making a final payment of 10 per cent., is raising the ordinary dividend for the year ended May 31 last to 15 per cent, compared with 10 per cent for the previous year.

**Diesel Tugs for the Aire & Calder.**—British Transport Waterways are to purchase five new diesel tugs, at an estimated cost of £82,000, for the coal compartment boat fleet which operates in the North Eastern Waterways Division. The coal-carrying compartment boat system, unique in this country, is used for the conveyance of nearly 700,000 tons of coal each year from the West Riding coalfield to the Humber port of Goole. Up to 19 steel compartment boats, each carrying about 40 tons of coal, are linked together to

form "trains" which are hauled by a single tug. At Goole, the boats are lifted by special hydraulic hoists and their contents tipped into the holds of sea-going vessels.

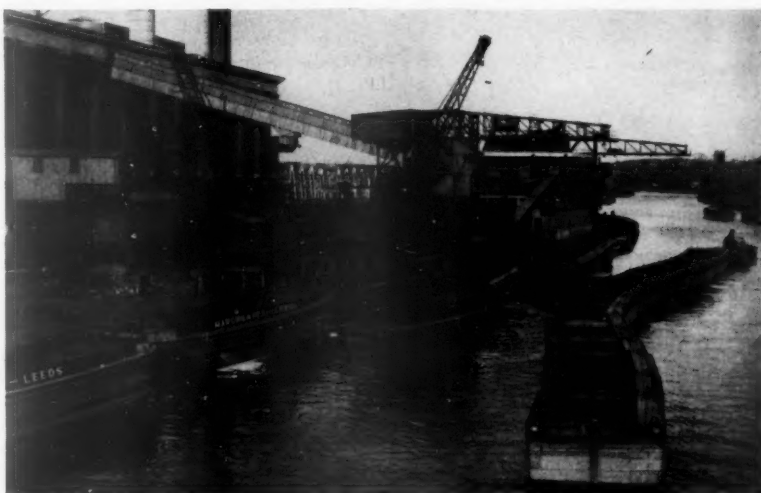
**Keith Blackman Limited Acoustic Laboratory.**—Keith Blackman Limited has inaugurated an acoustic laboratory at the company's head office and works at Tottenham, London, N.17; designed to permit the accurate study of industrial noise generation and its suppression.

**Waymouth Automatic Petrol Economiser.**—The price of the Waymouth Automatic Mixture Control unit, described on page 312 of our September 13 issue, is £5 8s. 6d., and not, as was stated, through incorrect information being supplied to use, £5. The correct name of the distributor is Fuel Conservation (Automotive) Limited.

**British Institute of Management National Conference.**—A conference on the speedy application of research leading to better methods of management is being organised this autumn by the British Institute of Management. The theme will be "research—a signpost to better management," and it will be held at Bournemouth on November 6-8. This will be the twelfth national management conference to be held by the B.I.M. since its foundation.

**Dowty Group Increased Dividend.**—The final payment has been raised to 5 per cent from 4 $\frac{1}{2}$  per cent by the Dowty Group of companies, so raising the dividend for the year ended March 31 to 9 per cent, tax free, compared with 7 $\frac{1}{2}$  per cent, tax free, for 1955-56. Group profits advanced by £156,389 to £1,651,580, but, after allowing £141,238 more for tax at £859,258, net profits emerged only £15,151 higher at £792,322. The balance carried forward is raised by £576,322 to £1,712,260.

**New East Anglian Overnight Express Freight Service.**—On October 7 the Eastern Region is to introduce a new East Anglian overnight express freight service in both directions between Stratford Market and Norwich Victoria, operating on Mondays to Fridays inclusive. A feature of the new service is that traders will be able to hire wagon space, at a minimum of



*Tug and train of compartment boats on the Aire & Calder Navigation passing Ferry-bridge Power Station coal wharf*



one wagon, at advantageous rates. As an example, a wagon load of up to 12 tons can be hauled for 110 miles at a cost of £5. For large regular two-way traffic the charge drops to £4 1s. Standard covered vans with a weight capacity of 12 tons and a cubic capacity of 900 cu. ft. will be used, and these can be sealed if desired.

**Greenwood's & Airvac Ventilating Co. Ltd. at Building Exhibition.**—At the Building Exhibition to be held at Olympia, London, from November 13 to 27, Greenwood's & Airvac Ventilating Co. Ltd. will display a range of ventilation equipment for natural and mechanical ventilation applications, including special purpose ventilators for all types of buildings. New designs include the Roofline natural extractor for industrial buildings, the continuous ventilated rooflight, the Permanent horizontal window ventilator, and a special exhibit of the Greenwood-Airvac conduit systems.

**Brown Bayley's Steels Limited.**—The net profit for the year ended July 31 is £106,511, which compares with £93,027 for the previous year, and the dividend is 270 (250) per cent tax free. Net current assets are £23,244 (£23,158). The company's 300,000 ordinary 2s. 6d. shares will be replaced by 2.4 million £1 ordinary shares in a new company, Brown Bayley Limited, under a reorganisation scheme. Shareholders will be asked to authorise the distribution of the new shares at the rate of eight for each 2s. 6d. share held at the annual meeting on September 27.

**Roof Reconstruction at Carlisle Citadel.**—New awning roofs over most of the platforms are to be built at Carlisle Citadel. Demolition work on the old overall roof, built 1878, is now well ahead, and more than half the steelwork for the new awning on platform No. 1 has been erected. The old roof will be replaced by awning roofs supported by columns 25 ft. apart. Part of the old roof, the north-east span, is to remain; this was re-covered in 1955

as a preliminary stage of the present reconstruction scheme. The original roof has main girders more than 100 ft. long which support roof trusses of unusual design.

#### **Powell Duffryn Limited Annual Report.**

—The report to the directors of Powell Duffryn Limited for the year ended March 31, submitted to the annual general meeting on September 19, shows a group trading profit of £2,789,922, compared with £2,475,761 for the previous year. The reserve for taxation including estimated liability for income tax 1957-58 and deferred liability on initial allowances totals £1,444,157 (£1,388,129) and current liabilities and provisions amount to £35,165,499 (£33,237,961).

#### **Sheepbridge Engineering Limited.**

—Although poor conditions in the motor trade from July, 1956, affected those subsidiaries engaged on engine components and so on, group earnings were offset by good results from other subsidiaries concerned with the aircraft, machine tool and general engineering trades and by the inclusion of profits from a recently acquired company. The group trading balance of £1,290,000 was little changed, being only £8,000 lower than the previous year. The dividend is maintained at 15 per cent.

#### **Midland Railway Co. of Western Australia Ltd.**

—Gross receipts of the Midland Railway Co. of Western Australia Ltd. for the year ended June 30, 1956, were £669,954, compared with £645,963 for the previous year. Working expenses were £619,341 (£557,100), leaving net receipts at £50,613 (£88,863), to which is added, in respect of interest, dividends, and registration fees, £6,368 (£5,515). Expenditure on renewals was £76,377 (£29,105), provision for renewals and deferred maintenance £6,400 (£58,550), depreciation of road service department fixed assets £11,301 (£10,449), bringing, with taxes, interest, and London expenses, total deduction to £106,168, giving an adverse balance of

£49,187 (£38,229). The adverse balance, together with the deficit of £116,933 brought forward from the previous year, less £9,001 written back from taxation, leaves a debit balance on revenue account of £157,119 to be carried forward. No alterations were made in freight rates or fares during the year, but there were three increases in the basic wage rate. Working expenses also suffered a full year's effect of increases in margin wage rates, which covered only six months of the previous year. Railway goods ton-mileage at 31,300,000 showed an increase of 8 per cent over the previous year. Passenger receipts and the number of journeys both showed decreases.

#### **New Station Opening at Butlers Lane.**

—Butlers Lane, a temporary station, which has been experimentally installed by the London Midland Region of British Railways to meet the needs of a housing estate under development, opens for traffic on September 30. Butlers Lane, between Four Oaks and Blake Street Stations, will be served by the diesel trains on the Birmingham, Sutton Coldfield, and Lichfield line. The new station consists of two platforms 250 ft. long, each with a small booking office and a waiting shelter. There is a sloping pathway from the road to each platform.

#### **Lee Guinness Limited Obtain Swedish Control Gear Licence.**

—An agreement has been signed between Lee Guinness Limited, Newtownards, N. Ireland, and Allmänna Svenska Elektriska A.B., of Sweden, for the manufacture under licence of A.S.E.A.-designed contactors which will be incorporated in automatic control gear. The agreement includes arrangements for full technical liaison between the British and Swedish companies. It was recently announced that a new factory was to be erected for Lee Guinness at Newtownards as part of an expansion of the company's activities. This factory, expected to commence production next year, has been planned for the manufacture of automatic control gear.

#### **Enfield Cables Limited Installs Telex.**

—Enfield Cables Limited has installed Telex at its sales headquarters (Home, Overseas and Contracts) and nine Sales Branches throughout the country. The Telex number which has been allocated to the Sales Headquarters, Victoria House, Southampton Row, London, W.C.1, is 23813; Telex numbers for the Sales Branches are: Birmingham, 33106; Brighton, 8730; Bristol, 44203; Cardiff, 49224; Glasgow, 77606; Leeds, 55153; Manchester, 66194; Newcastle-upon-Tyne, 53245; Nottingham, 37625.

#### **Rubber Improvement Limited.**

—Mr. John Lewis, chairman of Rubber Improvement Limited, has announced that his company and the directors of Hay & Robertson Limited, of Dunfermline, have negotiated terms for an offer by Rubber Improvement Limited to acquire the whole of the issued ordinary shares of Hay & Robertson Limited. The offer will be of one "A" ordinary share of 2s. in Rubber Improvement for every three ordinary shares of 4s. each in Hay & Robertson, and will be subject to acceptance by the holders of at least 90 per cent of the ordinary shares or such smaller proportion as Rubber Improvement may accept. The "A" ordinary shares to be issued in exchange will rank *pari passu* as one class with the existing "A" ordinary shares

### Inaugural Run of "Fair Maid"



The northbound "Fair Maid," a new Anglo-Scottish express, passing New Barnet, Eastern Region, on September 16 behind No. 60015 "Quicksilver"

in Rubber Improvement. Such shares confer the right to vote when the preference shareholders of Rubber Improvement are entitled to do so and otherwise rank *pari passu* in all respects with the ordinary shares in Rubber Improvement, except that they will not rank for any dividend in respect of any financial period before June 1, 1957. The directors of Hay & Robertson have agreed to accept the offer in respect of their own holdings.

**Channel Tunnel Meeting.**—A meeting of the Channel Tunnel study group, formed in July last, was held in the offices of the Suez Canal Company in Paris on September 24. The Chairman was M. René Massigli, and among those present was Mr. Leo d'Eranger, Chairman of the Channel Tunnel Company.

**Silentbloc Limited Fail to Match Previous Year's Results.**—The 1956-57 results have been lower than the previous record year. The gross profits, £241,000 up to the end of May, are 20 per cent lower than last year. Earnings on the one-class capital are reduced from 74.5 to 55.3 per cent, but dividend policy has been conservative and the maintained 25 per cent dividend remains comfortably covered.

**Cyanide Danger After Collision.**—A collision between a train and a lorry at Thamesville, Ontario, on September 19, caused some 15 tons of cyanide to be spilt over a wide area. Supplies of a chemical to neutralise the cyanide were sent urgently from Detroit, one load arriving on the day of the collision and the other in the early hours of the next morning. Reports that rain or dew would cause the cyanide to give off poisonous fumes caused considerable alarm in the vicinity until it had been neutralised.

**Higher Bus Fares.**—The West Midland Traffic Commissioners on September 24 granted 13 bus companies in Staffordshire permission to increase fares by amounts ranging from ½d. to 2d. Southdown Motor Services Limited was granted permission by the South Eastern Traffic Commissioners at Brighton increase by 1d. all single fares not revised in January, with proportionate increases on return and season tickets. The Yorkshire Traffic Commissioners granted United Automobile Services Limited increases ranging from ½d. to 4d. for single fares and from 2d. to 4d. for return fares.

**Refugees in Refrigerator Wagon.**—Two Yugoslav refugees were found in a refrigerator wagon which arrived in Brussels from Zagreb on September 21. The men, who were suffering from exposure after five days in the wagon, were found after the yard staff had heard cries for help. They told police officers that two companions had left Zagreb two days before them, on September 14, in a similar wagon bound for Britain. A message was passed to London asking that two refrigerator wagons known to have entered Britain from Yugoslavia a few days before should be examined.

**Weaver Navigation Development.**—British Transport Waterways is to carry out improvements on the Weaver Navigation, in the North Western Division. The programme is part of the B.T.C. £5½ million development plan for principal inland waterways, and is designed to enable this short but important water route to cater for the increasing use of sea-going vessels.

The programme includes bank protection and navigation works; mechanisation of locks and sluice improvements; dredging plant; and workshops and other premises.

**Hoffmann Interim Dividend.**—The Hoffmann Manufacturing Co. Ltd. is raising its interim dividend from 2½ per cent last year to 3½ per cent, tax free, for 1957. The final ordinary dividend for 1956 was 10 per cent, giving a total of 12½ per cent, tax free.

**Peter Brotherhood Limited Results.**—Peter Brotherhood Limited has recommended an unchanged final payment of 15 per cent to maintain the ordinary dividend at 20 per cent. Profits for the year ended March 31 advanced to £164,778 from £142,908 for 1955-56, after providing £211,000 (£157,000) for tax.

**British Aluminium Co. Ltd.**—The interim ordinary dividend of the British Aluminium Co. Ltd. is held at 4 per cent. The ordinary £1 shares allotted on September 9, 2,000,000 in number, do not rank for this dividend. For 1956 the final payment was 8 per cent, the rate forecast for 1957 on the increased capital.

**George Cohen 600 Group Report.**—The total group turnover of the George Cohen 600 Group Limited, for the year ended March 31, was £31,917,000 compared with £25,559,000 for last year. This is shown in the report by the directors of the company, which was to be submitted to the annual general meeting held on September 24. Group net earnings totalled £2,337,000 (£1,857,000) net profits after tax being £1,098,000 (£890,000). The dividend on the £3,125,000 ordinary stock of 13 per cent (12 per cent) took £203,048 (£158,125).

**Control of British MonoRail Limited.**—Control of British MonoRail Limited has been acquired by a group of industrialists and financiers headed by Mr. James Dallas, which has purchased the entire British shareholding—some 80 per cent of the issued capital. The company has now been reorganised to cope with rapid expansion. The company will continue to operate from Wren Works, Chadderton, Lancs, as manufacturers of automatic transfer and overhead handling equipment. When the company was first formed, 20 per cent of the shares were given to the American MonoRail Company in return for full co-operation, including drawings, patents, goodwill, and staff training facilities. This arrangement will continue under the new control.

**Freight by Road.**—Continuing the correspondence in *The Manchester Guardian* referred to on page 342 of our issue of September 20, Mr. H. Silvester wrote in a letter published on September 20: "Mr. Brebner of the British Transport Commission is getting us into dark tunnels over payment for the track. According to his Commission's accounts for 1956, British Railways spent during that year £95 million—or 20 per cent of their working expenses—on maintenance and renewal of ways and structures (Account VI-1d) and £7.5 million on capital account on additions and improvements, after writings off (Account V-10). Yes, the cost of the track is a serious matter for the railways, but they at least get what they pay for. . . ." In a letter published on September 25, Mr. J. H. Brebner, Public Relations Adviser to the British Transport Commission, states that the

£95 million refers to maintenance and renewal of way and structures, whereas figures quoted in his letter of September 14 quite clearly referred only to new works and improvements. "If Mr. Silvester wishes to widen the issue to include the costs of maintenance and upkeep as well as those of new works and improvements," Mr. Brebner comments, "may I remind him that unlike commercial users of the roads, the railways bear directly the whole costs not only of maintaining the tracks they use, but also of signalling and controlling movement upon them."

**Crossley-Premier Engines Limited Dividend.**—An unchanged ordinary dividend of 15 per cent is announced by Crossley-Premier Engines Limited, controlled by Crossley Bros. Ltd. Net profits for the year ended April 30 were virtually unchanged at £42,983, against £42,056 for 1955-56, after allowing £38,000 (same) for tax.

**Crossley Bros. Ltd.**—For the third successive year the dividend on the deferred ordinary stock units of Crossley Bros., Ltd., manufacturers of diesel and gas engines, is brought up to 12 per cent with a final payment of 9 per cent. Group trading profits for the year ended April 30 declined to £390,737 from £443,634 for 1955-56. After tax of £131,135 (£148,362), net profits were returned at £143,814, against £162,517. Only the accounts of the home subsidiary—Crossley-Premier Engines Limited—have been consolidated.

## Forthcoming Meetings

Open currently and until further notice.—

**British Transport Commission: Historical Exhibition "Transport Treasures"** in Shareholders' Meeting Room, Euston Station, from 10 a.m. to 6 p.m. on weekdays, and 2 to 6 p.m. on Sundays. Admission 6d.

September 28 (Sat.) to October 2 (Wed.).—**Railway Students' Association**, annual convention at Aberdeen.

September 30 (Mon.).—**Railway Correspondence & Travel Society**, London Branch, at the Railway Clearing House, Eversholt Street, London, N.W.1. Paper on "The North Eastern Region of British Railways," by Mr. R. A. Savill, Assistant (Mineral) to the Chief Traffic Manager, N.E.R.

October 1 (Tue.).—**Permanent Way Institution**, Leeds & Bradford Section, in the British Railways Social & Recreation Club, Ellis Court, Leeds City North Station, at 7 p.m. Paper on "Work study," illustrated by lantern slides, by Mr. R. W. Bailey, Assistant (Productivity and Works Study) to General Manager, L.M.R.

October 1 (Tue.) to October 3 (Thu.).—**Institution of Mechanical Engineers**, Conference on lubrication and wear, to be held in London.

October 2 (Wed.).—**British Railways (Southern Region) Lecture & Debating Society**, in the Chapter House, St. Thomas's Street, S.E.1, at 6 p.m. Opening address by Major-General Szlumper. Mr. C. P. Hopkins, President of the Society, and General Manager of the Southern Region, will preside.

October 2 (Wed.).—**Electric Railway Society**, at the Fred Tallan' ull, 153 Drummond Street, N.W.1, at 15

- p.m. Film show: "Electric Railway Variety."
- October 3 (Thu.).—Institution of Electrical Engineers, at Savoy Place, London, W.C.2, at 5.30 p.m. Presidential address by Mr. T. E. Goldup.
- October 3 (Thu.).—British Railways (Western Region) London Lecture & Debating Society, in the Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, W.2, 5.45 p.m. Paper on "The railways and railwaymen as seen by industry," by Mr. Arthur Chamberlain, Member, Western Area Board of the B.T.C.
- October 3 (Thu.).—The Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Paper on "Practical model railway electrification," by Mr. F. J. Briggs.
- October 4 (Fri.).—The Railway Club, at 320, High Holborn, London, W.C.1, at 7 p.m. Paper on "Some arrangements for the international working of passenger traffic on the Continent," by Mr. N. W. Sprinks.
- October 5 (Sat.).—Permanent Way Institution, London Section. Visit to British Railways Research Laboratories at Derby.
- October 8 (Tue.).—South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, at the Angel Hotel, Westgate Street, Cardiff, at 6.30 p.m. Paper on "The Outlook in Modern Railway Operation," illustrated by lantern slides, by Mr. S. G. Hearn, Chief Operating Superintendent, Western Region, Paddington.
- October 12 (Sat.).—Permanent Way Institution, Manchester & Liverpool Section, at the Manchester College of Technology, Sackville Street, Manchester, at 2.30 p.m. Talk on "The work of the B.T.C. mining service," by Mr. M. Fletcher.
- October 23 (Wed.).—Railway Students' Association, at the London School of Economics and Political Science, Houghton Street, W.C.2, at 6.30 p.m. Presidential Address by Mr. A. H. Grainger, Deputy Chairman, London Transport Executive. Mr. J. W. Watkins, retiring President, in the chair.

## OFFICIAL NOTICES

**MECHANICAL ENGINEERING DRAUGHTSMEN.** Applications are invited from draughtsmen with previous experience of mechanical engineering. Knowledge of electric traction would be an advantage. The Company is situated in a rural district within easy reach of a large town. The working conditions are excellent with full canteen and recreational facilities and a good pension scheme. Five-day week.—Applications should be made in writing giving age, education, experience and qualifications, to Box Y940, c/o Streets, 110 Old Broad Street E.C.2.

**THE NIGERIAN RAILWAY CORPORATION** invites applications for the following post: **RESIDENT ENGINEER.** Salary £2,350 per annum on contract terms with 20 per cent. gratuity per annum of total pay. Qualifications: Candidates, over 35 years of age, must be A.M.I.C.E., or have Engineering degree from recognised University, and have wide experience in reinforced concrete and steel. Railway experience desirable but not essential. Tours: 15 months' tours followed by 15 weeks' leave in U.K. on full pay. Allowances: In addition there are attractive allowances. Send postcard before 8th October, 1957, mentioning the post and this paper for further particulars and application form to: The London Representative, Nigerian Railway Corporation, 11 Manchester Square, London, W.1.

**ASSISTANT ENGINEER (Mechanical)** required for their London Office by the Crown Agents for Oversea Governments and Administrations for appointment normally to pensionable establishment on probation for two years. Salary scale £805 by £25 to £855 by £30 to £1,005 by £40 to £1,085 by £40 to

£1,165 by £45 to £1,210 by £40 to £1,250 a year. The £805 minimum is linked to entry at age 25 and is subject to increase at rate of one increment for each year above that age up to 34. Fully qualified officers at least 27 years old may be eligible for special increase of £75 after two years' service. Prospect of promotion. Candidates should have passed qualifying examination A.M.I.Mech.E. or equivalent examination. They should have served apprenticeship or pupillage in the rolling stock department of British Railways or with carriage and wagon builders or a firm specialising in manufacture wharf or railway breakdown cranes. They should also have subsequent drawing office experience in design of carriages and wagons, diesel railcars or cranes, together with a sound knowledge of modern workshop practice. Duties include preparation of contract specifications, examination and approval of drawings, design calculations, and technical correspondence. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2A/40807/RA.

**ASSISTANT ELECTRICAL ENGINEER, East African Railways and Harbours Administration.** For general duties in the Railway and Harbour Administration. Appointment on agreement for two years with prospect of permanency. Salary range £1,170-£1,765 p.a. Free furnished quarters if available and free passages for officer, wife and family up to cost of three adult fares in all. Generous leave, low taxation. Candidates must be between 25 and 35 and must have obtained a degree or diploma in Electrical Engineering at a University or College recognised by the Institution of Electrical Engineers, and have become at least Graduate Members of that Institution; they must in addition have served an apprenticeship of not less than two years with a firm of electrical engineers or other organisation of good standing, followed by at least a further two years' experience, particularly in electricity supply and workshops installations. Alternatively, candidates must have served a full apprenticeship in electrical engineering, have become Graduate Members of the Institution of Electrical Engineers, and had at least four years' experience of the nature indicated subsequent to apprenticeship. Knowledge of electric or Diesel-electric traction would be an advantage. Write Director of Recruitment, Colonial Office, London, S.W.1, stating age, qualifications and experience. Quote BCD.175/015.

**FOR SALE OR HIRE, Hudswell Clarke 0-6-0 standard gauge STEAM LOCOMOTIVE, in good condition.—Apply Eagle Construction Co. Ltd., Scunthorpe, Lincolnshire. 'Phone 4513 (7 lines).**

**CITY OF LIVERPOOL.** Tenders are invited for the purchase of one 100 h.p. SENTINEL VERTICAL ENGINE CHAIN DRIVEN 0-4-0 STEAM LOCOMOTIVE, built 1948. Makers No. 9390. Boiler last inspected 30/11/56 (in order). For further particulars and order to view apply to City Engineer and Surveyor, Municipal Buildings (Tel. No. Central 8433). Tenders to be sent by post to the undersigned so as to arrive by 10 a.m. on Tuesday, 12th November, 1957. Endorse envelope "Tender for Locomotive (F. & G.P.)" in top left-hand corner.—Thomas Alker, Town Clerk, Municipal Buildings, Liverpool, 2. (J.4920.)

**THE Director General of India Store Department, Government Building, Bromyard Avenue, Acton, London, W.3, invites tenders for the supply of:** (1) MAIN BAR FRAME with Frame Clips, completely machined on all faces, 17 right-hand—17 left-hand; (2) MAIN BAR FRAME SLAB rough, 53 right-hand—53 left-hand. Forms of tender may be obtained from the above address on or after the 27th September, 1957, at a fee of 10s. which is not returnable. If payment is made by cheque, it should please be made payable to "High Commissioner for India." Tenders are to be delivered by 2 p.m. on Monday, 11th November, 1957. Please quote reference No. 57/57 DB/Rly.2.

**BOUND VOLUMES.**—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press, Limited, 33 Tothill Street, London, S.W.1.

## Railway Stock Market

The initial heavy fall both in British Funds and industrial shares which followed the shock of the hoisting of the bank rate from 5 per cent to 7 per cent was followed by a slight recovery, encouraged by an improvement in the £ in relation to the U.S. dollar and the German mark. The heavy price falls at the end of last week were due largely to marking down by jobbers. A yield of around 5½ per cent is now obtainable of 3½ per cent War Loan, for example, and in the circumstances, shares of leading companies cannot be

valued on a 3 or 4 per cent yield basis unless there are good prospects of an increased dividend.

For the time being it must be expected that stock markets will tend to move with the trend of the £ in the foreign exchange market, but, looking ahead, it is recognised that many companies will face reduced earnings because of the increase in the credit squeeze and the slowing down of expansion plans both by private industry and by the nationalised industries.

So far the set-back in home securities has not had the effect of drawing attention to shares of British-owned companies overseas, and foreign rails, for instance, have moved closely with the prevailing market trend. Despite the generous yield of over 14 per cent, Antofagasta ordinary stock was down to 28, compared with 30½ a week ago, and the preference stock, which yields more than 12 per cent, has come back from 41½ to 40½. Moreover, Chilean Northern debentures receded from 40 to 38½ and Mexican Central "A" debentures from 70½ to 68½. Taita Railway shares were slightly higher at 13s. 9d. and International of Central America shares were quoted at \$26½. San Paulo Railway 3s. ordinary units were 2s. 4½d.

Canadian Pacific reflected the downward trend of dollar stocks earlier in the week and were \$60, compared with \$65½ a week ago, with the preference stock and 4 per cent debentures at £52 and £59 respectively. Peru Transport "B" shares eased to \$1½, while White Pass shares were \$17, a decline of \$1½ on balance. Elsewhere, Nyasaland Railways shares remained at 10s. and the 3½ per cent debentures at 56½.

The prospect of a slowing down of the railway modernisation programme led to selling of shares of locomotive builders and engineers, which were also affected by the set-back in stock markets generally.

Westinghouse Brake shares were 31s. compared with 37s. 3d. a week ago, and Charles Roberts 5s. shares have dropped from 10s. 1½d. a week ago to 9s. 6d.

Reflecting the prevailing mood, Beyer, Peacock 5s. shares were 8s. 7½d., compared with 9s. 6d. and Hurst Nelson fell from 31s. 6d. to 29s. ½d., while there was a drop in North British Locomotive, which were only 11s. 9d., against 14s. 3d. last week. Birmingham Wagon were again quoted at 18s. 6d. but G. D. Peters receded from 27s. 6d. to 26s. 3d. Wagon Repairs 5s. shares at 12s. 9d. lost only ½d. and Gloucester Wagon were helped by the increase in the dividend and rose to 16s. 6d., a gain of 1s. 3d. on balance.

Active and widely held shares have been affected considerably by the market set-back. Associated Electrical, for instance, were 54s. 6d. compared with 61s. a week ago, English Electric 53s. compared with 60s. and General Electric fell 2s. 6d. to 44s. In other directions, Ruston & Hornsby fell from 29s. to 25s. 9d. and Vickers, which remained under the influence of the big new issue, have fallen sharply to 32s. 3d. and are now below the issue price of 33s. for the new shares. Owing to the changed conditions resulting from the 7 per cent bank rate the terms of the issue have not the attractions they had a week ago, and the market therefore fears that a large proportion will have to be taken up by the underwriters. Reflecting the general trend, British Oxygen have also come back on balance from 35s. to 33s. and British Aluminium from 53s. 9d. to 49s. 3d. Shares of the Dowty Group were 31s. 6d. ½d. compared with 34s. 6d. a week ago. T. W. Ward have declined on balance from 76s. to 68s. 9d.



